United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Ford County, Illinois

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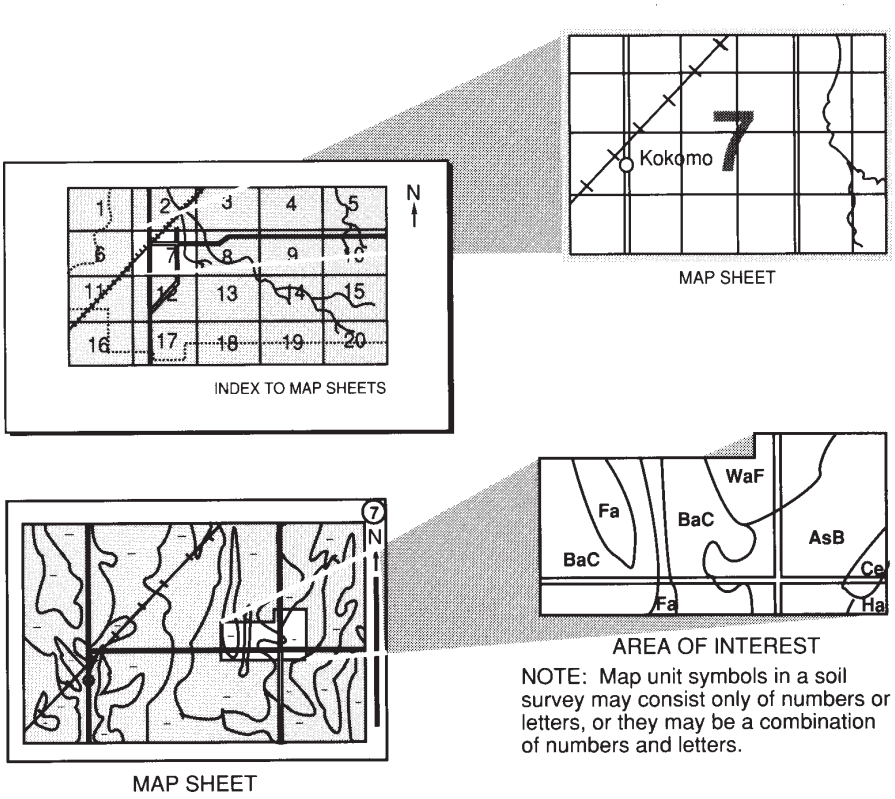
How To Use This Soil Survey

The **detailed soil maps** can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 2000. Soil names and descriptions were approved in 2001. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2000. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Ford County Soil and Water Conservation District.

Cover: The State soil of Illinois is Drummer silty clay loam. The Drummer series was established in Ford County in 1929 and was named for Drummer Creek and Drummer Grove, which are pictured here.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov.

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service.

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State Conservationist
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Soil Survey of
Ford County, Illinois

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United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Illinois Agricultural Experiment Station

Ford County is in east-central Illinois (fig. 1). It has an area of 312,320 acres, or about 490 square miles. It is bordered on the south by Champaign County, on the west by Livingston and McLean Counties, on the north by Kankakee, Livingston, and Iroquois Counties, and on the east by Iroquois and Vermilion Counties. In 2000, the population of Ford County was 14,241 (U.S. Department of Commerce, 2000). Paxton is the county seat.

This soil survey is a subset of Major Land Resource Area (MLRA) 108A, the Illinois and Iowa Deep Loess and Drift, and MLRA 110, the Northern Illinois and Indiana Heavy Till Plain (U.S. Department of Agriculture, 1981). It updates an earlier survey published in 1990 (Fehrenbacher, 1990). The updated survey provides additional information and more recent interpretations and includes larger maps, which show the soils in greater detail.

General Nature of the County

This section provides general information about Ford County. It describes history and development; physiography, relief, and drainage; agriculture; transportation facilities; industry; and climate.

History and Development

Native Americans of the Illinois, Kickapoo, Miami, and Potawatomi tribes originally inhabited the area now known as Ford County. The first permanent European settlements were established in the early 1800s.

Ford County was named after Thomas Ford, the seventh governor of Illinois. On February 17, 1859, it was established as the last county in the State (Ford County Historical Society, 1884). The county seat was originally Prairie City, which was renamed Prospect City. The name of the town was changed to Paxton in the hope of attracting Sir Paxton of England to settle there.

Physiography, Relief, and Drainage

Ford County consists of moraines, outwash plains, lake plains, stream terraces, flood plains, beach

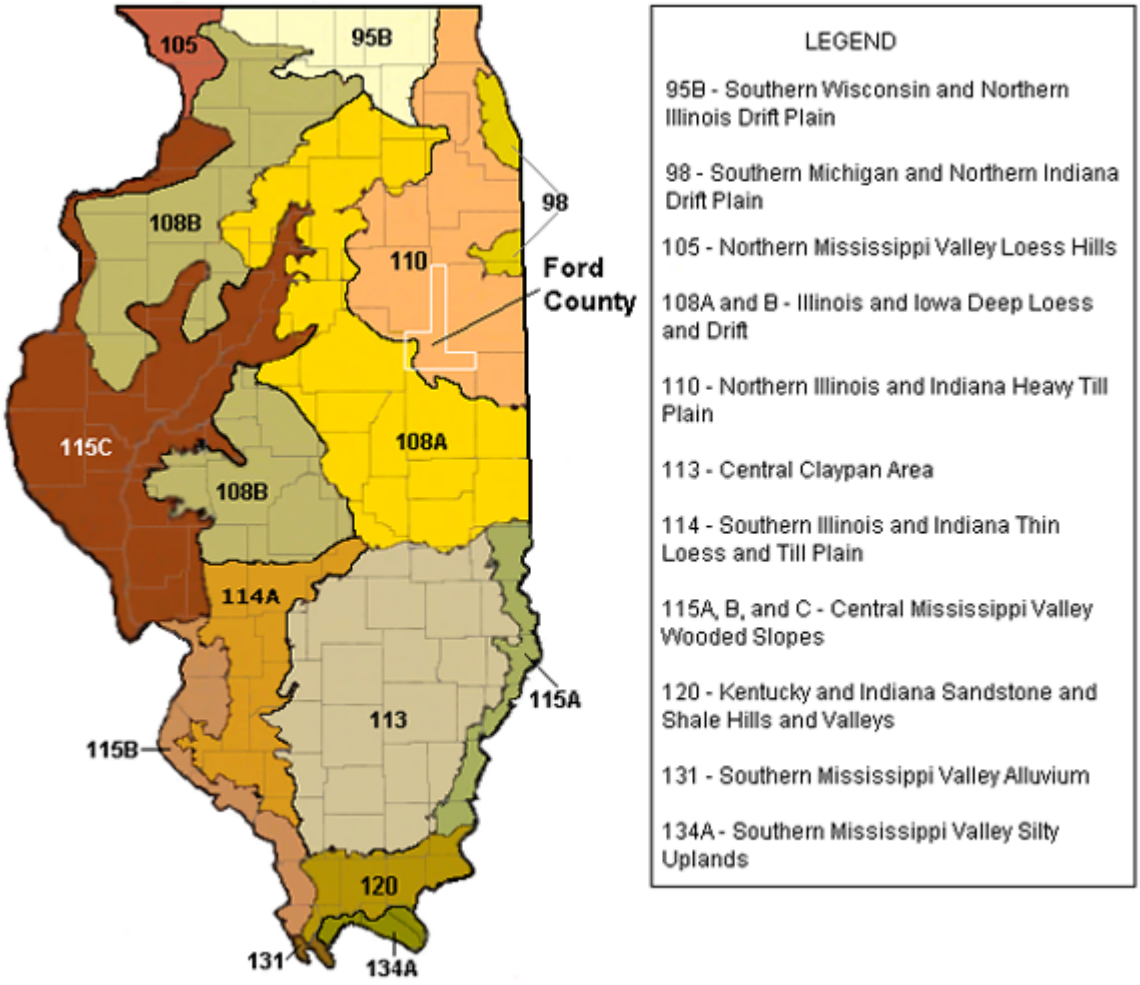

Figure 1.—Location of Ford County and the major land resource areas (MLRAs) in Illinois.

ridges, and bogs. The county is in the Till Plains Section of the Central Lowland Province (Leighton and others, 1948). Two subdivisions within the section make up the survey area. The Kankakee Plain, which is in the northern part of the county, makes up about 15 percent of the county. The Bloomington Ridged Plain makes up the rest of the county. It is in the extreme northern part of the county and throughout the central and southern parts.

Ford County is underlain by three major types of bedrock. Silurian dolomite is in the central part of the county, Devonian shale and limestone are in the Paxton area, and Pennsylvanian sandstone is north of Roberts.

The material over the bedrock was deposited during three major glacial periods. These were the Kansan, Illinoian, and Wisconsinan glaciations. Of the three periods, the Wisconsinan had the most influence. A number of moraines run through the county. From north to south, these are the Ransom, Cullom, Chatsworth, Ellis, Paxton, Gifford, Minonk, El Paso, Eureka, Newtown, and Bloomington moraines. The thickness of the deposits associated with the moraines ranges from 50 to 400 feet; the maximum thickness occurs in the Paxton area (Willman and Frye, 1970). These deposits are till, a material compacted by the weight of the ice sheet; lacustrine material (with textures ranging from silt loam to silty clay) that settled out in still lake water; and sandy beach deposits from glacial Lake Watseka. The glacial lake formed when the Chatsworth Moraine blocked the flow of meltwater from the glaciers.

Relief in Ford County is a result of differences in the thickness of deposits left by the most recent glacier. The highest feature in the county is in an area on the Bloomington Moraine west of Gibson City, where the

elevation is 866 feet above sea level. The lowest elevation, about 650 feet, is in the glacial lake plain area just northwest of Piper City (fig. 2).

The watershed divide between the Illinois and Wabash Rivers runs through the central part of Ford County. Prairie Creek, Spring Creek, Pigeon Creek, the East and West Branches of the Middle Fork Vermilion River, and the Sangamon River drain southeast to the Wabash River. The East Branch of the Mazon River, Horse Creek, the North Fork of the Vermilion River, Indian Creek, and the Mackinaw River drain northwest to the Illinois River. Dredging has modified many of these creeks.

Agriculture

Farming has been the most important enterprise in Ford County since the county was first settled. In 1997, crops were produced on about 300,307 acres (U.S. Department of Commerce, 1997). The number of farms was 550. Corn was grown on 144,815 acres, soybeans on 145,330 acres, wheat on 1,495 acres, and hay on 1,816 acres. In 1997, the number of livestock in Ford County totaled 4,191 head of cattle, 40,048 hogs, and 425 head of sheep (U.S. Department of Commerce, 1997). The market value of agricultural products sold was more than $100 million.

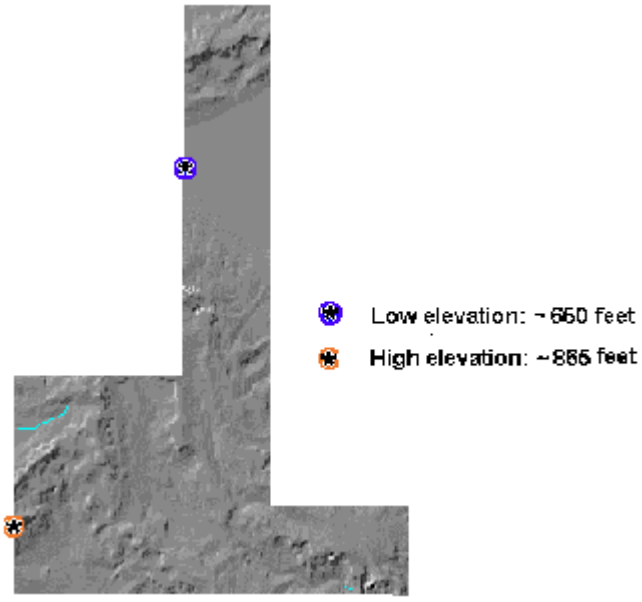

Figure 2.—Generalized relief map of Ford County, Illinois, showing the location of the highest and lowest elevations in the county.

Transportation Facilities

Ford County has a well-developed transportation system of highways and railroads. U.S. 45 and Interstate 57 pass through the county near Paxton. Illinois Routes 115 and 47 are major north-south routes, and Illinois Routes 9 and 116 are major east-west routes. Paxton and Gibson City both have airports, and many towns are served by railroads.

Industry

A number of industries are located in Ford County. The principal industries are related to agriculture. These include grain processing plants, grain handling terminals, and farm machinery. Other manufactured products are commercial air conditioners, refrigerant evaporator coils, brooms, and precast concrete products.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Gibson City in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 26.7 degrees F and the average daily minimum temperature is 18.7 degrees. The lowest temperature on record, which occurred at Gibson City on January 5, 1999, was -25 degrees. In summer, the average temperature is 72.2 degrees and the average daily maximum temperature is 83.4 degrees. The highest temperature, which occurred at Gibson City on August 18, 1988, was 103 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is 36.29 inches. Of this total, 21.9 inches, or about 60 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall on record was 6.25 inches at Gibson City on July 9, 1951. Thunderstorms occur on about 48 days each year, and most occur between May and August.

The average seasonal snowfall is 23.1 inches. The greatest snow depth at any one time during the period of record was 17 inches recorded on January 31, 1979. On average, 30 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 10 inches recorded on December 19, 1973.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 67 percent of the time possible in summer and 46 percent in winter. The prevailing wind is from the south. Average windspeed is highest, between 11 and 12 miles per hour, from November to April.

How This Survey Was Made

Soil surveys are updated as part of maintenance projects that are conducted for a major land resource area or other region. Maintaining and coordinating soil survey information within a broad area result in uniformly delineated and joined soil maps and in coordinated interpretations and map unit descriptions for areas that have similar physiography, climate, and land use.

Updated soil survey information is coordinated within the major land resource area or other region and meets the standards established and defined in the memorandum of understanding. Soil surveys that are consistent and uniform within a broad area enable the coordination of soil management recommendations and a uniform program application of soil information.

This survey was made to provide updated information about the soils and miscellaneous areas in the survey area, which is a subset of MLRA 108A and MLRA 110. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses.

During the previous survey and the update survey, soil scientists observed the steepness, length, and shape of the slopes; the degree of erosion; the general pattern of drainage; and the kinds of crops and native plants. They made borings and dug holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landform merge into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries. After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. This information can also be used to run statistical analyses for specific soil properties. The results of these analyses, along with other observations, enable the soil scientists to assign the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior

of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

Aerial photographs used in this update survey were taken in 1993–94. Soil scientists also studied U.S. Geological Survey topographic maps and orthophotographs to relate land and image features. Adjustments of soil boundary lines were made on the soil maps published in the 1990 survey to coincide with the U.S. Geological Survey topographic map contour lines and tonal patterns on aerial photographs. Aerial photographs also show trees, buildings, fields, roads, and rivers, all of which help in locating soil boundaries accurately.

Formation and Classification of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification.

Formation of the Soils

Soil forms through processes that act on deposited geologic material. The factors of soil formation are the physical and mineralogical composition of the parent material; the climate in which the soil formed; the plant and animal life on and in the soil; the relief; and the length of time the processes of soil formation have acted on the parent material (Jenny, 1941).

Climate and plant and animal life are the major active factors of soil formation. They act directly on the parent material either in place or after it was moved from place to place by water, wind, or glaciers, slowly changing it into a natural body that has genetically related horizons. Relief modifies soil formation and can inhibit soil formation on the steeper, eroded slopes and in wet, depressional or nearly level areas by controlling the moisture status of soils. Finally, time is needed for the parent material to change into a soil that has differentiated horizons.

The factors of soil formation are so closely interrelated and conditioned by each other that few generalizations can be made regarding the effects of any one factor unless the effects of the other factors are understood.

Parent Material

Parent material is the unconsolidated geologic formations from which soil develops. The strong influence of parent material on the soils in Ford County was recognized in the first soil survey of the county (Smith and others, 1941; Stauffer, 1935). The dominant parent materials were deposited during the Woodfordian Substage of the Wisconsinan Glaciation, about 12,500 to 22,000 years ago (Willman and Frye, 1970). Four distinct methods of deposition have resulted in four types of deposits—till, outwash, lacustrine material, and loess. These deposits are in a complex pattern of intertwining ground moraines, end moraines, outwash plains, and lake plains. Various amounts of loess or silty material overlie the other deposits. Soil properties vary among these types of deposits, and they also vary somewhat within the types. In a few areas the soils formed in material that was deposited in more recent times, such as alluvium and organic material.

Till is nonstratified drift transported and deposited directly by glacial ice sheets. Two till members cover the county. The Batestown till member is in the southwestern part of the county. The rest of the county is made up of the Yorkville till member. The two members are part of the Lemont Formation of the Wedron Group (Hansel and Johnson, 1996). The deposits are generally uniform within relatively short horizontal and vertical distances. The till is calcareous and is firm or very firm. It varies greatly in texture from one place to another. This variation directly causes differences among the soils. Clarence and Rowe soils formed in till of silty clay and clay. Bryce and Swygert soils formed in silty clay till. They are more permeable in the upper part of the profile than the Clarence and Rowe soils. Ashkum and Elliott soils formed in silty clay loam till. Dana and Raub soils formed in till of loam and silt loam. In general, soils that formed in the loamy and silty till have a thicker solum than that of soils that formed in the clayey till.

Glacial outwash was deposited by moving water in front of the melting ice sheets. The particle size of the material that was deposited depended on the speed of the water flow. As the water velocity slowed, the larger particles were initially deposited. Over a further distance, as the water velocity was reduced, the smaller particles were deposited. Layers of deposition are readily apparent within very short vertical distances but are less obvious within horizontal distances. The outwash deposits in Ford County are silty, loamy, and sandy and in some areas have gravelly layers. They are generally friable. La Hogue and Selma soils formed in outwash.

Lacustrine material was deposited in the relatively still water of glacial lakes, such as glacial Lake Watseka. In this material, vertical variation is greater than horizontal variation. The layers are commonly thicker than those in glacial outwash. The lacustrine material is silty and clayey and is friable or firm.

Milford, Martinton, and Pella soils are on glacial lake plains. Many other soils, including Rutland soils, show evidence of lacustrine material deposited on top of till. Also, narrow outwash ridges are beach deposits of past shorelines of glacial lakes. Ridgeville and Onarga soils are examples of outwash soils on beach ridges.

Sometime after the glaciers retreated, conditions became drier and the winds increased. A layer of silty material, or loess, was deposited over the county directly by the winds. The primary sources of the loess were the flood plains along major rivers. Some of the silty material in the county may be of local origin since it contains more sand than is typical of loess. Loess covers the till, outwash, and lacustrine material throughout most of the county. The loess is generally uniform within vertical and horizontal distances. It ranges from about 30 inches thick in the western part of the county to about 10 inches thick in the southeastern part. The upper part of the profile of Brenton, Dana, Drummer, and Proctor soils formed in loess.

Alluvium is material and sediments recently deposited by floodwater. It is silty or clayey and is friable or firm. The texture depends on the velocity of the floodwater and the texture of the sediment in the water. Sawmill and Zook soils formed in alluvium.

Organic deposits consist of decomposed plant remnants. After the glaciers receded, water was left standing in depressional areas. As a result, these areas were very wet during the period of soil formation, and the decaying plant material accumulated more quickly than it decomposed. Most of these plant remains are decomposed to a point that they are unrecognizable. These organic deposits are called sapric material. Houghton soils are examples of soils that formed in these deposits. Soils that formed in this material are naturally wet during most of the year and are in depressions that are heavily vegetated with grasses and wetland plants.

Climate

Ford County has a temperate, humid continental climate. The general climate has had an important overall influence on the characteristics of the soils. It is essentially uniform throughout the county, however, and has not caused any major differences among the soils.

Climate has a very important influence on weathering, vegetation, and erosion. The weathering of minerals in the soil increases as temperature and rainfall increase. As water moves downward, clay is moved from the surface soil to the subsoil, where it accumulates. The water also dissolves soluble salts and leaches them downward. Climate also influences the kind and extent of plant and animal life. The climate in Ford County has generally favored prairie grass and hardwood forests. Heavy rains can harm exposed areas of soil that are farmed or in the process of being developed. Spring rains and wind can cause extensive erosion when crop residue, trees, and other vegetative cover are removed from the surface. More soil will be lost through erosion each year than is formed by natural processes.

Living Organisms

Soils are affected by the vegetation under which they formed. The main contribution of the vegetation and biological processes is the addition of organic matter and nitrogen to the soil. The amount of organic material in the soil depends on the kind of native plants that grew on the soil. Grasses have many fine fibrous roots that add large amounts of organic matter to the soil when they die and decay. Therefore, most of the soils have a dark, fertile, relatively thick surface soil. Prairie grasses once covered about 98 percent of the acreage in Ford County. Dana and Elliott soils formed under prairie vegetation. The soils in the rest of the county formed under forest vegetation. The surface layer of the soils that formed under forest vegetation is lighter colored and generally thinner than that of the soils that formed under grasses because less organic matter is added to the soil. Camden and Del Rey soils formed under forest vegetation.

Bacteria, fungi, and other micro-organisms help to break down the organic material and thus provide nutrients for plants and other soil organisms. The stability of soil aggregates, which are structure units made up of sand, silt, and clay, is affected by microbial activity because cellular excretions from these organisms help to bind soil particles together. Stable aggregates help to maintain soil porosity and promote favorable relationships among soil, water, and air. Moreover, earthworms, crayfish, insects, and burrowing animals tend to incorporate organic matter into the soil and to keep soils open and porous.

Human activities also are important factors in Ford County. They have had a pronounced effect on past soil formation and on present and future soil development. Over the last century, the conversion of land to crop production resulted in land being drained, cleared, and cultivated. Furthermore, the addition of lime and fertilizers and the application of herbicides and pesticides affect the kind and number of organisms in and on the soil.

Topography

Relief, which includes elevation, topography, and water table levels, largely determines the natural drainage of soils. In Ford County, the slopes range from 0 to 20 percent. Natural soil drainage ranges from well drained on the backslopes and summits to very poorly drained on toeslopes.

Relief affects the depth to the seasonal high water table or natural drainage of the soil by influencing infiltration and runoff rates. The poorly drained Drummer and Bryce soils are in low-lying, nearly level areas and have a water table close to the surface for most of the year. The soil pores contain water, which restricts the circulation of air in the soil. Under these conditions, iron and manganese compounds are chemically reduced. As a result, the subsoil is dull gray and mottled. In the more sloping, well drained Penfield and Proctor soils, the water table is lower and some of the rainfall runs off the surface. The soil pores contain less water and more air. The iron and manganese compounds are well oxidized. As a result, the subsoil has brown colors.

Local relief also influences the severity of erosion. Even though some erosion occurs on almost all sloping soils, the hazard of erosion generally is more severe as the slope increases. The runoff and the removal of soil material in the steeper areas result in the formation of soils that have a thinner solum than that of soils in the less sloping areas.

Time

The length of time needed for the formation of a soil depends on the other factors of soil formation. Soils form more rapidly and are more acid if the parent material is low in lime content. Thus, more rapidly permeable soils form more readily than the more slowly permeable soils because lime and other soluble minerals are leached more quickly. Forest soils form more quickly than prairie soils because grasses are more efficient than trees in recycling calcium and other bases from the subsoil to the surface layer. Soils in humid climates that support good growth of vegetation form more rapidly than those in dry climates.

The length of time that the parent materials have been in place determines, to a great extent, the degree of profile development. Most of the soils in Ford County began formation with the retreat of the last glacier about 12,500 years ago. On flood plains, however, material is deposited during each flood. This continual deposition slows development.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 4 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquoll (*Aqu*, meaning water, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Endoaquolls (*Endo*, meaning within, plus *aquoll*, the suborder of the Mollisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Endoaquolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-

size class, mineral content, soil temperature regime, cation-exchange activity class, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, superactive, mesic Typic Endoaquolls.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Ashkum series.

Soil Series and Detailed Soil Map Units

In this section, arranged in alphabetical order, each soil series recognized in the survey area is described. Each series description is followed by descriptions of the associated detailed soil map units.

Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the headings "Use and Management of the Soils" and "Soil Properties."

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on

the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Swygert silty clay loam, 2 to 4 percent slopes, eroded, is a phase of the Swygert series.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see Contents) give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Ashkum Series

Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Colluvium and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Ashkum silty clay loam, 0 to 2 percent slopes; at an elevation of 705 feet; 96 feet south and 2,030 feet east of the northwest corner of sec. 22, T. 34 N., R. 11 E., in Will County, Illinois; USGS Manhattan topographic quadrangle; lat. 41 degrees 25 minutes 28 seconds N. and long. 87 degrees 57 minutes 24 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many very fine roots; neutral; clear smooth boundary.

A—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common very fine roots; neutral; clear smooth boundary.

BAg—12 to 18 inches; dark gray (2.5Y 4/1) silty clay loam; moderate very fine and fine subangular blocky structure; firm; common very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; neutral; clear smooth boundary.

Bg1—18 to 29 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; neutral; clear wavy boundary.

2Bg2—29 to 49 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (10YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/8) and faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium faint gray (5Y 5/1) iron depletions in the matrix; 8 percent gravel; neutral; gradual wavy boundary.

2BCg—49 to 54 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to weak coarse angular blocky; firm; few very fine roots; common fine very dark gray (10YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/6) and faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Cg—54 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; common fine prominent yellowish brown (10YR 5/6) and common fine and medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the colluvium: 15 to 40 inches
Depth to carbonates: 24 to 60 inches
Thickness of the solum: 30 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 or 1
Texture—silty clay loam or silty clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N

Value—3 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Bg horizon:
Hue—2.5Y, 5Y, 5GY, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Cg horizon:
Hue—2.5Y, 5Y, 5GY, or N
Value—5 or 6
Chroma—0 to 2
Texture—silty clay loam
Content of gravel—less than 10 percent

232A—Ashkum silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Toeslopes

Map Unit Composition

Ashkum and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that contain more clay in the subsoil than the Ashkum soil
- Soils that contain more sand in the subsoil than the Ashkum soil
- Soils that are darker in the upper part of the subsoil than the Ashkum soil

Dissimilar soils:
- The somewhat poorly drained Elliott soils on summits and footslopes
- The moderately well drained Varna soils on backslopes and summits
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Ashkum Soil

Parent material: Colluvium and the underlying till
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 9.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 7 percent
Shrink-swell potential: High
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods (fig. 3)
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Blount Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon for MLRA 110

Blount silt loam, 0 to 2 percent slopes; at an elevation of 705 feet; 2,480 feet south and 1,203 feet west of the

Figure 3.—A surface drainage ditch removes excess water from an area of Ashkum silty clay loam, 0 to 2 percent slopes.

northeast corner of sec. 29, T. 26 N., R. 6 E., in Livingston County, Illinois; USGS Fairbury topographic quadrangle; lat. 40 degrees 41 minutes 39 seconds N. and long. 88 degrees 32 minutes 59 seconds W., NAD 27:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; few fine roots; moderately acid; abrupt smooth boundary.

E—7 to 13 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; moderate thin platy structure; friable; few fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; abrupt smooth boundary.

2Bt1—13 to 17 inches; brown (10YR 5/3) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; 3 percent gravel; moderately acid; clear smooth boundary.

2Bt2—17 to 26 inches; grayish brown (10YR 5/2) silty clay; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 3 percent gravel; slightly acid; clear smooth boundary.

2Bt3—26 to 32 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct gray (5Y 5/1) clay films on faces of peds; many medium prominent gray (5Y 6/1) iron depletions in the matrix; 3 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Cd—32 to 60 inches; 60 percent light olive brown (2.5Y 5/4) and 40 percent gray (5Y 6/1) silty clay loam; massive; very firm; common medium prominent white (10YR 8/1) calcium carbonate concretions throughout; 5 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of loess or other silty material: Less than 18 inches
Depth to carbonates: 19 to 40 inches
Thickness of the solum: 30 to 48 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silt loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or silty clay
Content of gravel—2 to 10 percent

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or clay loam
Content of gravel—2 to 14 percent

23A—Blount silt loam, 0 to 2 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Footslopes and summits

Map Unit Composition

Blount and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Blount soil
- Soils that contain more sand in the subsoil than the Blount soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes
- The moderately well drained, clayey Orthents on summits and backslopes

Properties and Qualities of the Blount Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained

Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 30 to 48 inches to dense material
Available water capacity: About 8.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 0.5 foot to 2.0 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: High
Corrosivity: High for steel and concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

23B2—Blount silt loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Blount and similar soils: 95 percent
Dissimilar soils: 5 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Blount soil
- Soils that contain more sand in the subsoil than the Blount soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are slightly eroded

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Blount Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 30 to 48 inches to dense material
Available water capacity: About 7.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 0.5 foot to 2.0 feet (January through May)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Corrosivity: High for steel and concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Brenton Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon for MLRA 108

Brenton silt loam, 0 to 2 percent slopes; at an elevation of 715 feet; 1,722 feet south and 114 feet east of the northwest corner of sec. 10, T. 22 N., R. 8 E., in Champaign County, Illinois; USGS Gibson City East topographic quadrangle; lat. 40 degrees 22 minutes 45 seconds N. and long. 88 degrees 17 minutes 24 seconds W., NAD 27:

Ap—0 to 10 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.
AB—10 to 16 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; common very fine roots; neutral; clear smooth boundary.
Bt1—16 to 26 inches; brown (10YR 4/3) silty clay

loam; moderate fine subangular blocky structure; friable; common very fine roots; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films in root channels and pores; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bt2—26 to 35 inches; brown (10YR 4/3) and dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; many distinct dark grayish brown (10YR 4/2) clay films in pores; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide nodules throughout; common fine distinct brownish yellow (10YR 6/6) and prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common fine distinct light gray (10YR 7/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

2Bt3—35 to 53 inches; dark yellowish brown (10YR 4/4) and brown (10YR 5/3) clay loam; moderate medium prismatic structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide nodules throughout; common fine distinct very pale brown (10YR 7/3) iron depletions in the matrix; slightly acid; abrupt smooth boundary.

2C—53 to 72 inches; brownish yellow (10YR 6/8) and light gray (10YR 7/2), stratified silt loam and sandy loam with thin layers of loamy sand; massive; friable; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 23 inches
Thickness of the loess: 24 to 40 inches
Depth to carbonates: More than 40 inches
Thickness of the solum: 40 to more than 60 inches

Ap or A horizon:
Hue—10YR
Value—2 to 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 7
Chroma—1 to 8
Texture—clay loam, loam, sandy loam, or silt loam
Content of gravel—less than 5 percent

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 7
Chroma—1 to 8
Texture—loam, sandy loam, clay loam, silt loam, or loamy sand
Content of gravel—less than 15 percent

149A—Brenton silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

Map Unit Composition

Brenton and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that contain loamy outwash beginning at a depth of less than 24 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Drummer soils on toeslopes
- The well drained Proctor soils on backslopes and summits

Properties and Qualities of the Brenton Soil

Parent material: Loess and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 11.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate

Apparent seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Bryce Series

Drainage class: Poorly drained
Permeability: Very slow
Landform: Glacial lakes (relict) and ground moraines
Parent material: Colluvium and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Vertic Endoaquolls

Typical Pedon for MLRA 110

Bryce silty clay, 0 to 2 percent slopes; at an elevation of 675 feet; 2,559 feet north and 45 feet west of the center of sec. 7, T. 25 N., R. 13 W., in Iroquois County, Illinois; USGS Woodworth topographic quadrangle; lat. 40 degrees 38 minutes 39 seconds N. and long. 87 degrees 52 minutes 23 seconds W., NAD 27:

Ap1—0 to 10 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; weak very fine granular structure; friable; few fine black (7.5YR 2.5/1) weakly cemented nodules of iron and manganese oxides throughout; slightly acid; abrupt smooth boundary.

Ap2—10 to 13 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate medium angular blocky structure; friable; moderately acid; abrupt smooth boundary.

Bg—13 to 19 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; friable; many distinct black (10YR 2/1) organic coatings on faces of peds; common fine distinct dark grayish brown (2.5Y 4/2) and few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear wavy boundary.

Btg1—19 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; many distinct dark gray (10YR 4/1) clay films on faces of peds; many distinct black (N 2.5/0) organo-clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

Btg2—24 to 35 inches; olive gray (5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few slickensides on faces of peds; common distinct olive gray (5Y 4/2) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common fine black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint dark gray (2.5Y 4/1) iron depletions in the matrix; neutral; gradual smooth boundary.

Btg3—35 to 45 inches; gray (5Y 5/1) silty clay; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few fine roots; few continuous distinct dark gray (5Y 4/1) clay films on faces of peds; few slickensides and pressure faces on faces of peds; common medium prominent light olive brown (2.5Y 5/4) and few medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

2BCg—45 to 58 inches; gray (5Y 5/1) silty clay; weak very coarse prismatic structure; very firm; common coarse prominent brown (10YR 4/3) and common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine white (10YR 8/1) very weakly cemented calcium carbonate nodules and weakly cemented calcium carbonate concretions throughout; 1 percent fine gravel; slightly effervescent; moderately alkaline; clear smooth boundary.

2Cg—58 to 66 inches; gray (5Y 5/1) silty clay; massive; very firm; many medium prominent olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; 3 percent fine gravel; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the colluvium: 15 to 55 inches
Depth to carbonates: 24 to 60 inches
Thickness of the solum: 30 to more than 60 inches

Ap or A horizon:
Hue—10YR or N
Value—2 to 3

Chroma—0 or 1
Texture—silty clay or silty clay loam

Bg or Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 6
Chroma—0 to 3
Texture—silty clay or clay
Content of gravel—less than 5 percent

2BCg or 2Cg horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—silty clay, clay, or silty clay loam
Content of gravel—less than 10 percent

235A—Bryce silty clay, 0 to 2 percent slopes

Setting

Landform: Glacial lakes (relict) and ground moraines
Position on the landform: Toeslopes

Map Unit Composition

Bryce and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that contain less clay in the subsoil than the Bryce soil
- Soils that contain carbonates beginning at a depth of more than 60 inches
- Soils that have a thicker dark surface soil than that of the Bryce soil

Dissimilar soils:
- The somewhat poorly drained Swygert soils on summits and footslopes
- The very poorly drained Rantoul soils on toeslopes

Properties and Qualities of the Bryce Soil

Parent material: Colluvium and the underlying till
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 5.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 5 to 7 percent
Shrink-swell potential: High
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Camden Series

Drainage class: Well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon for MLRA 110

Camden silt loam, 0 to 2 percent slopes; at an elevation of 755 feet; 890 feet south and 2,305 feet east of the northwest corner of sec. 8, T. 23 N., R. 9 E., in Ford County, Illinois; USGS Perdueville topographic quadrangle; lat. 40 degrees 28 minutes 12 seconds N. and long. 88 degrees 12 minutes 17 seconds W., NAD 27:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; moderate very fine and fine granular structure; friable; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

BE—8 to 13 inches; brown (10YR 4/3) silt loam; weak fine prismatic structure parting to moderate very fine and fine angular blocky; friable; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—13 to 20 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong medium prismatic structure parting to strong fine and medium angular blocky; firm; many faint brown (10YR 4/3) clay films on

faces of peds; slightly acid; clear smooth boundary.
Bt2—20 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong medium prismatic structure parting to strong medium angular blocky; firm; many faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.
Bt3—30 to 38 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common faint brown (10YR 4/3) clay films on faces of peds; few fine faint brown (10YR 5/3) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.
2Bt4—38 to 56 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium prismatic structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; about 10 percent gravel in some strata; slightly acid; gradual smooth boundary.
2C—56 to 60 inches; yellowish brown (10YR 5/6) and brown (10YR 5/3), stratified sandy loam and gravelly sandy loam; massive; friable; about 15 percent gravel in some strata; neutral.

Range in Characteristics

Thickness of the loess: 24 to 40 inches
Depth to carbonates: More than 60 inches
Thickness of the solum: 40 to more than 60 inches

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—clay loam, loam, sandy loam, or silt loam
Content of gravel—less than 10 percent

2C horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—stratified sandy loam, loam, silt loam, or loamy sand
Content of gravel—less than 15 percent

134A—Camden silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits

Map Unit Composition

Camden and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that have a darker surface layer than that of the Camden soil
• Soils that contain more clay in the subsoil than the Camden soil
• Soils that have slopes of more than 2 percent
• Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
• The poorly drained Drummer soils on toeslopes
• Somewhat poorly drained, silty soils on summits and footslopes

Properties and Qualities of the Camden Soil

Parent material: Loess and the underlying outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 11.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Flooding: None
Accelerated erosion: Slight
Potential for frost action: High
Corrosivity: Moderate for steel and concrete
Potential for surface runoff: Low

Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Chatsworth Series

Drainage class: Moderately well drained
Permeability: Very slow
Landform: End moraines and ground moraines
Parent material: Till
Slope range: 4 to 12 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Eutrudepts

Typical Pedon for MLRA 110

Chatsworth silty clay, 6 to 12 percent slopes, severely eroded; at an elevation of 735 feet; 148 feet north and 1,870 feet west of the southeast corner of sec. 7, T. 24 N., R. 10 E., in Iroquois County, Illinois; USGS Buckley topographic quadrangle; lat. 40 degrees 32 minutes 48 seconds N. and lat. 88 degrees 06 minutes 20 seconds W., NAD 27:

Ap—0 to 2 inches; dark grayish brown (2.5Y 4/2) silty clay, light brownish gray (10YR 6/2) dry; moderate medium granular structure; firm; common medium roots; slightly effervescent; moderately alkaline; abrupt smooth boundary.

Bw1—2 to 11 inches; dark grayish brown (2.5Y 4/2) silty clay; moderate very fine and fine subangular blocky structure; firm; few medium and fine roots; few fine white (10YR 8/1) very weakly cemented calcium carbonate nodules throughout; few fine distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; common fine faint dark gray (5Y 4/1) iron depletions in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.

Bw2—11 to 15 inches; dark grayish brown (2.5Y 4/2) silty clay; weak medium prismatic structure parting to moderate fine and medium angular blocky; very firm; few fine roots between peds; common faint dark gray (5Y 4/1) coatings on faces of peds; common medium white (10YR 8/1) very weakly cemented calcium carbonate nodules throughout; common fine distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; common fine faint dark gray (5Y 4/1) iron depletions in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bw3—15 to 22 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; few fine roots between peds; common faint dark gray (5Y 4/1) coatings on faces of peds; common medium white (10YR 8/1) very weakly cemented calcium carbonate nodules throughout; common fine distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; common fine faint dark gray (5Y 4/1) iron depletions in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd1—22 to 35 inches; dark grayish brown (2.5Y 4/2) silty clay; massive; very firm; few fine roots along cleavage planes; many faint gray (5Y 5/1) coatings along cleavage planes; few medium white (10YR 8/1) very weakly cemented calcium carbonate nodules along cleavage planes; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many fine faint gray (5Y 5/1) iron depletions in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2—35 to 60 inches; dark gray (5Y 4/1) silty clay; massive; very firm; very few fine roots along widely spaced cleavage planes; many faint gray (5Y 5/1) coatings along cleavage planes; few medium white (10YR 8/1) very weakly cemented calcium carbonate nodules along cleavage planes; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 0 to 20 inches
Thickness of the solum: 10 to 24 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 or 4
Chroma—1 or 2
Texture—silty clay

Bw horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 or 3
Texture—silty clay, clay, or silty clay loam

Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—1 to 6
Texture—silty clay, clay, or silty clay loam

241C3—Chatsworth silty clay, 4 to 6 percent slopes, severely eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes

Map Unit Composition

Chatsworth and similar soils: 96 percent
Dissimilar soils: 4 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that contain carbonates beginning at a depth of more than 20 inches

Dissimilar soils:
- The poorly drained Bryce soils on toeslopes

Properties and Qualities of the Chatsworth Soil

Parent material: Till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 10 to 24 inches to dense material
Available water capacity: About 3.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 1.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material (fig. 4).
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Very high
Hazard of water erosion: Moderate
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 6e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Figure 4.—An area of Chatsworth silty clay, 4 to 6 percent slopes, severely eroded, used for pasture. This soil is unsuited to cultivated crops because of the hazard of water erosion, the limited available water capacity, and poor tilth.

241D3—Chatsworth silty clay, 6 to 12 percent slopes, severely eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Chatsworth and similar soils: 96 percent
Dissimilar soils: 4 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 6 percent
- Soils that contain carbonates beginning at a depth of more than 20 inches

Dissimilar soils:
- The poorly drained Bryce soils on toeslopes

Properties and Qualities of the Chatsworth Soil

Parent material: Till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 10 to 24 inches to dense material
Available water capacity: About 3 inches to a depth of 60 inches

Content of organic matter in the surface layer: 0.5 to 1.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Very high
Hazard of water erosion: Moderate
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 7e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Chenoa Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part, slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Loess or other silty material and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Chenoa silty clay loam, 0 to 2 percent slopes; at an elevation of 691 feet; 100 feet south and 825 feet west of the northeast corner of sec. 2, T. 27 N., R. 3 E., in Livingston County, Illinois; USGS Flanagan South topographic quadrangle; lat. 40 degrees 47 minutes 19 seconds N. and long. 88 degrees 50 minutes 14 seconds W., NAD 27:

Ap—0 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few fine roots; neutral; abrupt smooth boundary.
BA—12 to 16 inches; brown (10YR 4/3) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; neutral; clear smooth boundary.
Bt—16 to 21 inches; brown (10YR 4/3) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct gray (10YR 5/1) iron depletions in the matrix; neutral; clear smooth boundary.
Btg1—21 to 26 inches; grayish brown (10YR 5/2) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint gray (10YR 5/1) iron depletions in the matrix; neutral; clear smooth boundary.
Btg2—26 to 32 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint gray (10YR 5/1) iron depletions in the matrix; neutral; clear smooth boundary.
2Bt—32 to 36 inches; light olive brown (2.5Y 5/4) silty clay loam; weak medium prismatic structure parting to weak medium angular blocky; firm; few very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common medium distinct gray (2.5Y 6/1) iron depletions in the matrix; 3 percent gravel; slightly alkaline; clear smooth boundary.
2C—36 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; massive; firm; few prominent light brownish gray (10YR 6/2) coatings on vertical cleavage planes; common medium distinct gray (2.5Y 6/1) iron depletions in the matrix; 3 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of loess or other silty material: 20 to 40 inches
Depth to carbonates: 25 to 45 inches
Thickness of the solum: 25 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3

Chroma—1 or 2
Texture—silty clay loam

Bt or Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silty clay

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silt loam
Content of gravel—less than 10 percent

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silt loam
Content of gravel—2 to 10 percent

614A—Chenoa silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

Map Unit Composition

Chenoa and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
• Soils that have a thinner surface layer than that of the Chenoa soil
• Soils that contain less clay and more silt in the subsoil than the Chenoa soil
• Soils that have a seasonal high water table beginning at a depth of more than 2 feet
• Soils that contain carbonates beginning at a depth of more than 45 inches

Dissimilar soils:
• The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Chenoa Soil

Parent material: Loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.7 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 5 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Clarence Series

Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Ground moraines
Parent material: Till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls
Taxadjunct features: The Clarence soil in map unit 147B2 has a thinner mollic epipedon than is defined as the range for the series. This soil is classified as a fine, illitic, mesic Aquollic Hapludalf.

Typical Pedon for MLRA 110

Clarence silty clay loam, 0 to 2 percent slopes; at an elevation of 770 feet; 480 feet south and 1,590 feet east of the northwest corner of sec. 21, T. 24 N., R. 10 E., in Iroquois County, Illinois; USGS Buckley topographic quadrangle; lat. 40 degrees 31 minutes 48 seconds N. and long. 88 degrees 04 minutes 26 seconds W., NAD 27:

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.
A—7 to 11 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; friable; many fine roots; very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Btg1—11 to 16 inches; dark grayish brown (2.5Y 4/2) silty clay; weak fine subangular blocky structure; firm; common fine roots; common distinct dark grayish brown (10YR 4/2) clay films and very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Btg2—16 to 24 inches; dark grayish brown (2.5Y 4/2) clay; moderate medium angular blocky structure; firm; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films and few very dark gray (10YR 3/1) organo-clay films on faces of peds; many fine distinct light olive brown (2.5Y 5/4) and common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Btg3—24 to 29 inches; grayish brown (2.5Y 5/2) silty clay; weak medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark gray (5Y 3/1) organic coatings along root channels; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; very dark gray (10YR 3/1) krotovina; common fine prominent yellowish brown (10YR 5/6) and distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; common fine faint gray (10YR 5/1) iron depletions in the matrix; 3 percent gravel; slightly alkaline; clear smooth boundary.

BCg—29 to 39 inches; dark grayish brown (2.5Y 4/2) silty clay; moderate medium prismatic structure; very firm; few fine roots; few faint dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings along root channels; common medium white (10YR 8/1) soft masses of calcium carbonate throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct gray (10YR 6/1) iron depletions in the matrix; 1 percent gravel; slightly effervescent; moderately alkaline; gradual wavy boundary.

Cdg—39 to 60 inches; dark grayish brown (2.5Y 4/2), light olive brown (2.5Y 5/4), and gray (5Y 5/1) silty clay; massive; very firm; common medium white (10YR 8/1) soft masses of calcium carbonate throughout; few distinct calcium carbonate coatings on cleavage planes; 2 percent gravel; strongly effervescent (18 percent calcium carbonate equivalent); moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 20 to 38 inches
Thickness of the solum: 25 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam or silty clay

Bt or Btg horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 to 4
Texture—silty clay, clay, or silty clay loam

BCg horizon:
Hue—2.5Y or 5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay or clay
Content of gravel—less than 5 percent

Cd or Cdg horizon:
Hue—2.5Y, 5Y, or 5GY
Value—4 to 6
Chroma—1 to 6
Texture—silty clay or clay
Content of gravel—less than 5 percent

147A—Clarence silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Summits and footslopes

Map Unit Composition

Clarence and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that do not have a subsurface layer
- Soils that contain less clay in the subsoil than the Clarence soil
- Soils that have slopes of more than 2 percent
- Soils that contain till beginning at a depth of more than 20 inches

Dissimilar soils:
- The poorly drained Rowe soils on toeslopes

Properties and Qualities of the Clarence Soil

Parent material: Till
Drainage class: Somewhat poorly drained

Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 25 to 40 inches to dense material
Available water capacity: About 5.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: High
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

147B2—Clarence silty clay loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Clarence and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that contain less clay in the subsoil than the Clarence soil
• Soils that are only slightly eroded
• Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
• The poorly drained Rowe soils on toeslopes
• The moderately well drained Chatsworth soils on backslopes

Properties and Qualities of the Clarence Soil

Parent material: Till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 25 to 40 inches to dense material
Available water capacity: About 4.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Very high
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Dana Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part, moderately slow in the lower part
Landform: End moraines and ground moraines
Parent material: Loess and the underlying till
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Taxadjunct features: The Dana soil in map unit 56B2 has a thinner mollic epipedon than is defined as the range for the series. This soil is classified as a fine-silty, mixed, superactive, mesic Oxyaquic Hapludalf.

Typical Pedon for MLRA 108

Dana silt loam, 2 to 5 percent slopes; at an elevation of 706 feet; 1,810 feet north and 750 feet east of the southwest corner of sec. 10, T. 16 N., R. 14 W., in Edgar County, Illinois; USGS Newman topographic quadrangle; lat. 39 degrees 51 minutes 21 seconds N. and long. 87 degrees 56 minutes 05 seconds W., NAD 27:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 4/3) dry; moderate fine granular structure; friable; common very fine and fine roots throughout; moderately acid; clear smooth boundary.

Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots throughout; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—15 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; common very fine and fine roots between peds; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt3—25 to 32 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine and fine roots between peds; common medium vesicular and tubular pores; few distinct dark brown (10YR 3/3) organo-clay films on faces of peds and in pores; many distinct brown (10YR 4/3) clay films on faces of peds; common fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

2Bt4—32 to 38 inches; brown (10YR 5/3) clay loam; moderate medium prismatic structure; firm; few very fine and fine roots between peds; common medium vesicular and tubular pores; few distinct very dark grayish brown (10YR 3/2) organo-clay films along root channels and pores; many distinct brown (10YR 4/3) clay films on faces of peds; common fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; 3 percent fine and medium gravel; neutral; clear smooth boundary.

2Bt5—38 to 53 inches; brown (10YR 5/3) clay loam; moderate coarse prismatic structure; firm; few very fine and fine roots between peds; common medium and coarse vesicular and tubular pores; few prominent very dark gray (10YR 3/1) organo-clay films lining root channels and pores; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; many medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; common medium distinct gray (10YR 6/1) iron depletions in the matrix; 7 percent fine and medium gravel; neutral; clear smooth boundary.

2Bt6—53 to 58 inches; brown (10YR 5/3) clay loam; weak coarse angular blocky structure; firm; few very fine and fine roots between peds; common medium and coarse vesicular and tubular pores; few prominent very dark gray (10YR 3/1) organo-clay films lining root channels and pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct gray (10YR 6/1) iron depletions in the matrix; 7 percent fine and medium gravel; neutral; clear smooth boundary.

2C—58 to 80 inches; pale brown (10YR 6/3) loam; massive; firm; few fine and medium vesicular and tubular pores; common medium irregular brown (10YR 4/3) extremely weakly cemented iron and manganese oxide masses on horizontal fracture planes; few fine to coarse rounded yellowish red (5YR 5/8) weakly cemented iron oxide nodules throughout; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium rounded and irregular white (10YR 8/1) weakly cemented calcium carbonate nodules throughout; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct gray (10YR 6/1) iron depletions in the matrix; 7 percent fine and medium gravel; violently effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: 22 to 40 inches
Depth to carbonates: 40 to 60 inches
Thickness of the solum: 40 to more than 60 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5

Chroma—3 to 6
Texture—silty clay loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—clay loam
Content of gravel—1 to 7 percent

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—loam or clay loam
Content of gravel—1 to 15 percent

56B—Dana silt loam, 2 to 5 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Dana and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that have slopes of less than 2 percent or more than 5 percent
• Soils that have a thinner surface layer than that of the Dana soil
• Soils that have a seasonal high water table at a depth of less than 2 feet or more than 3.5 feet
• Soils that contain carbonates at a depth of less than 40 inches

Dissimilar soils:
• The poorly drained Drummer soils on toeslopes

Properties and Qualities of the Dana Soil

Parent material: Loess and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 11.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Low
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

56B2—Dana silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Dana and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that have slopes of less than 2 percent or more than 5 percent
• Soils that are only slightly eroded
• Soils that have a seasonal high water table at a depth of less than 2 feet or more than 3.5 feet
• Soils that contain carbonates at a depth of less than 40 inches

Dissimilar soils:
• The poorly drained Drummer soils on toeslopes

Properties and Qualities of the Dana Soil

Parent material: Loess and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 4 percent

Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Low
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Del Rey Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon for MLRA 110

Del Rey silt loam, 0 to 2 percent slopes; at an elevation of 663 feet; 155 feet south and 900 feet west of the northeast corner of sec. 1, T. 25 N., R. 11 E., in Iroquois County, Illinois; USGS Onarga West topographic quadrangle; lat. 40 degrees 40 minutes 43 seconds N. and long. 88 degrees 00 minutes 13 seconds W., NAD 27:

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.
E—4 to 9 inches; light brownish gray (10YR 6/2) silt loam, light gray (10YR 7/2) dry; moderate thin and medium platy structure; friable; many fine roots; moderately acid; abrupt smooth boundary.
Bt—9 to 12 inches; brown (10YR 5/3) silty clay loam; strong fine subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds and many distinct pale brown (10YR 6/3) (dry) clay depletions; very strongly acid; clear smooth boundary.
Btg1—12 to 25 inches; light brownish gray (2.5Y 6/2) silty clay; strong fine and medium subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.
Btg2—25 to 33 inches; 50 percent light brownish gray (2.5Y 6/2), 30 percent light olive brown (2.5Y 5/4), and 20 percent gray (10YR 6/1) silty clay; moderate fine and medium angular and subangular blocky structure; firm; common fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; strongly acid; gradual smooth boundary.
BCtg—33 to 41 inches; 35 percent light brownish gray (2.5Y 6/2), 35 percent gray (10YR 6/1), and 30 percent light olive brown (2.5Y 5/4) silty clay loam; weak coarse angular and subangular blocky structure; firm; few fine roots; common distinct grayish brown (2.5Y 5/2) clay films on vertical faces of peds; slightly alkaline; gradual smooth boundary.
Cg—41 to 60 inches; 55 percent grayish brown (10YR 5/2) and 45 percent yellowish brown (10YR 5/6 and 5/8) silty clay loam; massive; friable; few distinct light gray (10YR 7/1) (dry) clay depletions on bedding planes; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 24 to 48 inches
Thickness of the solum: 24 to 48 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Bt, Btg, or BCtg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silty clay

C or Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—silt loam or silty clay loam

192A—Del Rey silt loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Summits and footslopes

Map Unit Composition

Del Rey and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Del Rey soil
- Soils that contain less clay in the subsoil than the Del Rey soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Milford soils on toeslopes

Properties and Qualities of the Del Rey Soil

Parent material: Lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 0.5 foot to 2.0 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: High
Corrosivity: High for steel and concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

Drummer Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains and ground moraines
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 108

Drummer silty clay loam, 0 to 2 percent slopes; at an elevation of 715 feet; 300 feet north and 1,600 feet east of the southwest corner of sec. 19, T. 19 N., R. 9 E., in Champaign County, Illinois; USGS Urbana topographic quadrangle; lat. 40 degrees 05 minutes 04 seconds N. and long. 88 degrees 13 minutes 58 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; firm; many fine roots; moderately acid; clear smooth boundary.

A—7 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure parting to weak fine granular; firm; many fine and medium roots; slightly acid; clear smooth boundary.

BA—14 to 19 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine and medium subangular blocky structure; firm; many fine and medium roots; few fine faint very dark grayish brown (2.5Y 3/2) masses of manganese accumulation in the matrix; slightly acid; gradual smooth boundary.

Bg—19 to 25 inches; dark gray (10YR 4/1) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; many fine roots; common fine distinct and prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many wormholes; neutral; gradual smooth boundary.

Btg1—25 to 32 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine and medium prismatic structure parting to moderate fine angular blocky; firm; many fine roots; common distinct dark gray (N 4/0) clay films on faces of peds; many medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.

Btg2—32 to 41 inches; gray (N 5/0) silty clay loam; weak medium prismatic structure parting to weak medium angular blocky; firm; few fine roots; few distinct dark gray (N 4/0) clay films on faces of peds; many medium prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

2Btg3—41 to 47 inches; gray (N 5/0) loam; weak

coarse subangular blocky structure; friable; few fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 4 percent gravel; neutral; abrupt wavy boundary.

2Cg—47 to 60 inches; dark gray (10YR 4/1), stratified loam and sandy loam; massive; friable; many medium prominent olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; many medium prominent gray (N 5/0) iron depletions in the matrix; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of loess or silty material: 40 to 60 inches
Depth to carbonates: 40 to 65 inches
Thickness of the solum: 40 to 65 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—silty clay loam

Btg, Bg, or BA horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay loam or silt loam

2Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—loam, clay loam, silt loam, silty clay loam, or sandy loam
Content of gravel—less than 7 percent

2Cg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 7
Chroma—0 to 8
Texture—stratified loam, silt loam, clay loam, or sandy loam with strata of loamy sand
Content of gravel—less than 15 percent

152A—Drummer silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and ground moraines
Position on the landform: Toeslopes

Map Unit Composition

Drummer and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
• Soils that contain outwash beginning at a depth of less than 40 inches or more than 60 inches
• Soils that contain carbonates at a depth of less than 40 inches

Dissimilar soils:
• The poorly drained, calcareous Harpster soils on toeslopes
• The very poorly drained Peotone soils on toeslopes
• The moderately well drained Dana soils on summits and backslopes

Properties and Qualities of the Drummer Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 11.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 7 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Elliott Series

Drainage class: Somewhat poorly drained
Permeability: Slow

Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls
Taxadjunct features: The Elliott soil in map unit 146B2 has a thinner mollic epipedon than is defined as the range for the series. This soil is classified as a fine, illitic, mesic Aquollic Hapludalf.

Typical Pedon for MLRA 110

Elliott silt loam, 0 to 2 percent slopes; at an elevation of 704 feet; 690 feet south and 2,436 feet west of the center of sec. 21, T. 29 N., R. 8 E., in Livingston County, Illinois; USGS Cullom topographic quadrangle; lat. 40 degrees 58 minutes 12 seconds N. and long. 88 degrees 19 minutes 17 seconds W., NAD 27:

Ap—0 to 6 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.
A—6 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; slightly acid; clear smooth boundary.
Bt1—11 to 16 inches; light olive brown (2.5Y 5/4) silty clay; moderate fine subangular blocky structure; friable; common fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; neutral; clear smooth boundary.
2Bt2—16 to 23 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.
2Bt3—23 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; neutral; clear smooth boundary.
2Bt4—28 to 35 inches; olive brown (2.5Y 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few medium white (10YR 8/1) calcium carbonate concretions throughout; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
2Bt5—35 to 41 inches; olive brown (2.5Y 4/4) silty clay loam; weak fine prismatic structure parting to moderate medium angular blocky; firm; few fine roots; common distinct gray (5Y 6/1) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary.
2Cd—41 to 60 inches; olive brown (2.5Y 4/4) silty clay loam; massive; firm; common fine prominent gray (5Y 5/1) iron depletions in the matrix; 3 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of loess or silty material: Less than 20 inches
Depth to carbonates: 17 to 40 inches
Thickness of the solum: 20 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay
Content of gravel—less than 10 percent

2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam
Content of gravel—less than 15 percent

146A—Elliott silt loam, 0 to 2 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Summits and footslopes

Map Unit Composition

Elliott and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a thinner subsurface layer than that of the Elliott soil
- Soils that have slopes of more than 2 percent

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes
- The moderately well drained, clayey Orthents on summits and backslopes

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity: About 8.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 5 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

146B2—Elliott silty clay loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Elliott and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are only slightly eroded
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 4 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Graymont Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part; slow in the lower part
Landform: Ground moraines
Parent material: Loess and the underlying till
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Taxadjunct features: The Graymont soils in this survey area have a thinner mollic epipedon than is defined as the range for the series. These soils are classified as fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs.

Typical Pedon for MLRA 108

Graymont silt loam, 2 to 5 percent slopes, eroded; at an elevation of 820 feet; 2,275 feet north and 310 feet west of the southeast corner of sec. 12, T. 18 N., R. 11 E., in Bureau County, Illinois; USGS Mendota West topographic quadrangle; lat. 41 degrees 33 minutes 37 seconds N. and long. 89 degrees 10 minutes 03 seconds W., NAD 27:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; friable; many very fine and common fine roots; slightly acid; abrupt smooth boundary.

BA—8 to 14 inches; brown (10YR 4/3) silty clay loam; weak fine subangular blocky structure parting to moderate medium granular; friable; many very fine and common fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented manganese nodules throughout; few fine very weakly cemented iron oxide concretions throughout; moderately acid; clear smooth boundary.

Bt1—14 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented manganese nodules throughout; few fine very weakly cemented iron oxide concretions throughout; neutral; clear smooth boundary.

Bt2—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common fine black (7.5YR 2.5/1) very weakly cemented manganese nodules throughout; few fine very weakly cemented iron oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

2Bt3—24 to 31 inches; brown (10YR 5/3) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common fine black (7.5YR 2.5/1) very weakly cemented manganese nodules throughout; few fine very weakly cemented iron oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Bt4—31 to 35 inches; brown (10YR 5/3) silty clay loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; many very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; common fine black (7.5YR 2.5/1) very weakly cemented manganese nodules throughout; common medium very weakly cemented iron oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; 5 percent gravel; slightly alkaline; clear smooth boundary.

2BC—35 to 43 inches; brown (10YR 5/3) silty clay loam; weak medium prismatic structure; very firm; common very fine roots; few faint brown (10YR 5/3) clay films on faces of peds; very few distinct light gray (10YR 7/2) (dry) silt coatings on faces of peds; common fine black (7.5YR 2.5/1) very weakly cemented manganese nodules throughout; common fine very weakly cemented iron oxide concretions throughout; common fine prominent light reddish brown (2.5YR 6/4) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; 5 percent gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

2C—43 to 60 inches; brown (10YR 5/3) silty clay loam; massive with some vertical cleavage planes; very firm; few distinct light gray (10YR 7/2) (dry) silt coatings on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented manganese nodules throughout; few fine very weakly cemented iron oxide concretions throughout; common fine prominent light reddish brown (2.5YR 6/4) masses of iron accumulation in the matrix; 2 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: 20 to 40 inches

Depth to carbonates: 24 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam or silt loam

2Bt or 2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silt loam
Content of gravel—1 to 10 percent

2C or 2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silt loam
Content of gravel—2 to 15 percent

541B2—Graymont silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Ground moraines
Position on the landform: Summits and backslopes

Map Unit Composition

Graymont and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that have a seasonal high water table beginning at a depth of less than 2 feet or more than 3.5 feet
- Soils that contain carbonates beginning at a depth of more than 40 inches

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Graymont Soil

Parent material: Loess and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 4 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Moderate
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Harpster Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains, lake plains, and ground moraines
Parent material: Calcareous loess or other silty material over drift
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Calciaquolls

Typical Pedon for MLRA 108

Harpster silty clay loam, 0 to 2 percent slopes; at an elevation of 738 feet; 855 feet south and 70 feet west of the northeast corner of sec. 20, T. 23 N., R. 7 E., in Ford County, Illinois; USGS Gibson City West topographic quadrangle; lat. 40 degrees 26 minutes 24 seconds N. and long. 88 degrees 25 minutes 23 seconds W., NAD 27:

Apk—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; many snail shells; strongly effervescent (20 percent calcium carbonate equivalent); moderately alkaline; abrupt smooth boundary.
Ak—9 to 18 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine and medium granular structure; firm; common very fine roots; many snail shells; strongly effervescent (18

percent calcium carbonate equivalent); moderately alkaline; clear smooth boundary.

Bg1—18 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine and medium angular blocky structure; firm; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few snail shells; common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; slightly effervescent (7 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

Bg2—25 to 31 inches; dark gray (5Y 4/1) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few snail shells; few fine prominent dark yellowish brown (10YR 4/4) and few fine distinct olive (5Y 4/4) masses of iron accumulation in the matrix; slightly effervescent (5 percent calcium carbonate equivalent); slightly alkaline; gradual smooth boundary.

Bg3—31 to 36 inches; dark gray (5Y 4/1) silty clay loam; weak coarse prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common medium distinct olive (5Y 4/4) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; slightly effervescent (2 percent calcium carbonate equivalent); slightly alkaline; gradual smooth boundary.

Bg4—36 to 41 inches; 40 percent olive brown (2.5Y 4/4), 35 percent olive yellow (2.5Y 6/6), and 25 percent gray (5Y 5/1) silty clay loam; weak coarse angular blocky structure; firm; few very fine roots; 2 percent gravel; slightly effervescent (2 percent calcium carbonate equivalent); slightly alkaline; gradual smooth boundary.

Cg1—41 to 56 inches; 55 percent gray (5Y 5/1), 40 percent light olive brown (2.5Y 5/6), and 5 percent dark yellowish brown (10YR 4/4) silt loam; massive; firm; 1 percent gravel; strongly effervescent (16 percent calcium carbonate equivalent); moderately alkaline; clear smooth boundary.

Cg2—56 to 60 inches; gray (10YR 5/1) loam; massive; friable; 5 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches

Thickness of loess or other silty material: 36 to 60 inches

Depth to carbonates: Less than 16 inches

Thickness of the solum: 22 to 46 inches

Apk or Ak horizon:
- Hue—10YR, 2.5Y, 5Y, or N
- Value—2 to 3
- Chroma—0 or 1
- Texture—silty clay loam

Bg horizon:
- Hue—10YR, 2.5Y, 5Y, or N
- Value—3 to 6
- Chroma—0 to 2
- Texture—silty clay loam or silt loam; loam or clay loam included in the range for the lower part

Cg horizon:
- Hue—7.5YR, 10YR, 2.5Y, or 5Y
- Value—4 to 6
- Chroma—1 to 8
- Texture—silt loam, loam, sandy loam, or clay loam
- Content of gravel—less than 7 percent

67A—Harpster silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains, ground moraines, and lake plains

Position on the landform: Toeslopes

Map Unit Composition

Harpster and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are darker in the upper part of the subsoil than the Harpster soil
- Soils that do not contain carbonates at or near the surface
- Soils that contain more clay in the subsoil than the Harpster soil

Dissimilar soils:
- The poorly drained, noncalcareous Drummer soils on toeslopes
- Somewhat poorly drained, noncalcareous soils on summits and footslopes
- The very poorly drained, organic Houghton soils on toeslopes

Properties and Qualities of the Harpster Soil

Parent material: Calcareous loess or other silty material over drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Houghton Series

Drainage class: Very poorly drained
Permeability: Moderately slow
Landform: Ground moraines and outwash plains
Parent material: Herbaceous organic material
Slope range: 0 to 2 percent

Taxonomic classification: Euic, mesic Typic Haplosaprists

Typical Pedon for MLRA 110

Houghton muck, undrained, 0 to 2 percent slopes; at an elevation of 833 feet; 150 feet south and 2,508 feet west of the northeast corner of sec. 26, T. 25 N., R. 7 E., in Ford County, Illinois; USGS Sibley topographic quadrangle; lat. 40 degrees 36 minutes 08 seconds N. and long. 88 degrees 22 minutes 31 seconds W., NAD 27:

Oa1—0 to 12 inches; sapric material, black (N 2.5/0) broken face and rubbed; 2 percent fiber; moderate fine granular structure; very friable; common fine roots; neutral; clear smooth boundary.
Oa2—12 to 20 inches; sapric material, very dark gray (10YR 3/1) broken face and very dark grayish brown (10YR 3/2) rubbed; less than 1 percent fiber; moderate fine angular blocky structure; very friable; few fine roots; neutral; gradual smooth boundary.
Oa3—20 to 40 inches; sapric material, very dark grayish brown (10YR 3/2) broken face and rubbed; less than 1 percent fiber; weak medium angular blocky structure; very friable; few fine roots; neutral; gradual smooth boundary.
Oa4—40 to 60 inches; sapric material, very dark gray (10YR 3/1) broken face and very dark grayish brown (10YR 3/2) rubbed; less than 1 percent fiber; massive; very friable; slightly alkaline.

Range in Characteristics

Thickness of the organic material: More than 51 inches

Surface tier:
Hue—10YR or N
Value—2 to 3
Chroma—0 to 2

Subsurface tier:
Hue—10YR, 7.5YR, or N
Value—2 to 3
Chroma—0 to 3

1103A—Houghton muck, undrained, 0 to 2 percent slopes

Setting

Landform: Ground moraines and outwash plains
Position on the landform: Toeslopes

Map Unit Composition

Houghton and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have less organic matter in the surface layer than the Houghton soil
- Soils that have organic deposits less than 51 inches thick

Dissimilar soils:
- The poorly drained Drummer soils on toeslopes

Properties and Qualities of the Houghton Soil

Parent material: Herbaceous organic material

Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow to moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 23.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 70 to 99 percent
Shrink-swell potential: Not rated
Apparent seasonal high water table is highest (depth, months): At the surface to 0.5 foot below the surface (all year)
Ponding: 1 foot above the surface during wet periods
Flooding: None
Accelerated erosion: None
Potential for frost action: High
Corrosivity: High for steel and concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: High

Interpretive Groups

Land capability classification: 5w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

La Hogue Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon for MLRA 108

La Hogue loam, 0 to 2 percent slopes; at an elevation of 675 feet; 1,910 feet north and 150 feet east of the southwest corner of sec. 7, T. 19 N., R. 14 W., in Champaign County, Illinois; USGS Homer topographic quadrangle; lat. 40 degrees 07 minutes 05 seconds N. and long. 87 degrees 59 minutes 39 seconds W., NAD 27:

Ap—0 to 10 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine angular fragments (cloddy) parting to weak fine granular structure; friable; neutral; abrupt smooth boundary.
A—10 to 16 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure parting to moderate fine granular; friable; neutral; clear smooth boundary.
Bt1—16 to 26 inches; brown (10YR 4/3) clay loam; weak medium prismatic structure; friable; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; clear smooth boundary.
Bt2—26 to 36 inches; brown (10YR 4/3) sandy clay loam; moderate medium prismatic structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; neutral; clear smooth boundary.
Bt3—36 to 43 inches; brown (10YR 4/3) sandy loam; weak medium prismatic structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium distinct reddish brown (5YR 4/4) and common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; gradual smooth boundary.
Cg1—43 to 54 inches; 75 percent grayish brown (10YR 5/2) and 25 percent strong brown (7.5YR 5/6) sandy loam; massive; very friable; common medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium prominent reddish brown (5YR 4/4) masses of iron and manganese accumulation in the matrix; neutral; abrupt smooth boundary.
Cg2—54 to 61 inches; gray (10YR 5/1) sandy loam; massive; friable; common medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.
Cg3—61 to 65 inches; 55 percent light olive gray (5Y 6/2) and 45 percent brownish yellow (10YR 6/6) silt loam; massive; friable; common medium

prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; gradual smooth boundary.
Cg4—65 to 80 inches; 60 percent light brownish gray (2.5Y 6/2) and 40 percent yellowish brown (10YR 5/8), stratified silt loam and loam; massive; friable; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: More than 60 inches
Thickness of the solum: 35 to 60 inches

Ap or A horizon:
Hue—10YR
Value—2 to 3
Chroma—1 or 2
Texture—loam or silt loam

Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, loam, sandy clay loam, or sandy loam
Content of gravel—less than 7 percent

Cg or C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—stratified loam, sandy loam, silt loam, or loamy sand
Content of gravel—less than 15 percent

102A—La Hogue loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

Map Unit Composition

La Hogue and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that have a seasonal high water table beginning at a depth of more than 2 feet
• Soils that do not have a subsurface layer and have a thinner surface layer than that of the La Hogue soil

Dissimilar soils:
• The poorly drained Drummer soils on toeslopes
• The well drained Penfield soils on summits and backslopes

Properties and Qualities of the La Hogue Soil

Parent material: Outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 4 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Martinsville Series

Drainage class: Well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Outwash
Slope range: 5 to 10 percent

Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon for MLRA 108

Martinsville silt loam, 2 to 5 percent slopes; at an elevation of 695 feet; 250 feet south and 1,430 feet east of the northwest corner of sec. 36, T. 21 N., R. 7 E., in Champaign County, Illinois; USGS Rising topographic quadrangle; lat. 40 degrees 14 minutes 14 seconds N. and long. 88 degrees 21 minutes 37 seconds W., NAD 27:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine and fine granular structure; friable; common very fine roots; moderately acid; abrupt smooth boundary.

BE—9 to 12 inches; yellowish brown (10YR 5/4) silt loam; moderate fine angular blocky structure; friable; common very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.
Bt1—12 to 19 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to strong fine angular blocky; firm; common very fine roots; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.
Bt2—19 to 28 inches; strong brown (7.5YR 4/6) clay loam; weak medium prismatic structure parting to strong medium angular blocky; firm; many very fine roots; many distinct dark brown (7.5YR 3/4) clay films on faces of peds and in pores; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.
Bt3—28 to 36 inches; strong brown (7.5YR 4/6) sandy clay loam; moderate medium and coarse angular blocky structure; firm; common very fine roots; many distinct dark brown (7.5YR 3/4) clay films on faces of peds and in pores; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.
Bt4—36 to 45 inches; yellowish brown (10YR 5/4) sandy clay loam; weak coarse angular blocky structure; firm; few very fine roots; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; abrupt smooth boundary.
Bt5—45 to 57 inches; yellowish brown (10YR 5/4), stratified silt loam; weak coarse angular blocky structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; abrupt smooth boundary.
BCt—57 to 69 inches; yellowish brown (10YR 5/4), stratified silt loam, loam, and sandy loam; weak coarse angular blocky structure; friable; few distinct brown (10YR 4/3) clay films on vertical faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint pale brown (10YR 6/3) masses of iron depletion in the matrix; common fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.
C—69 to 80 inches; light yellowish brown (10YR 6/4), stratified loam and sandy loam; massive; friable; slightly acid.

Range in Characteristics

Depth to carbonates: More than 40 inches
Thickness of the solum: 40 to 70 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—loam or silt loam

E horizon (if it occurs):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—loam, sandy loam, or fine sandy loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—clay loam, loam, sandy clay loam, or sandy loam
Content of gravel—less than 10 percent

C horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—loam, sandy loam, silt loam, or loamy sand
Content of gravel—less than 10 percent

570C2—Martinsville loam, 5 to 10 percent slopes, eroded

Setting

Landform: Stream terraces and outwash plains
Position on the landform: Backslopes

Map Unit Composition

Martinsville and similar soils: 95 percent
Dissimilar soils: 5 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 5 percent or more than 10 percent
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have a darker surface layer than that of the Martinsville soil

Dissimilar soils:
- The poorly drained Drummer soils on toeslopes
- The poorly drained Sawmill soils on flood plains

Properties and Qualities of the Martinsville Soil

Parent material: Outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.5 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: Moderate for steel and concrete
Potential for surface runoff: Medium
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Martinton Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Martinton silt loam, 0 to 2 percent slopes; at an elevation of 650 feet; 425 feet north and 160 feet west of the southeast corner of sec. 5, T. 27 N., R. 7 E., in Livingston County, Illinois; USGS Forrest North topographic quadrangle; lat. 40 degrees 50 minutes 01 second N. and long. 88 degrees 26 minutes 03 seconds W., NAD 27:

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

A—7 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

BA—12 to 19 inches; brown (10YR 4/3) silty clay loam; moderate fine angular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Btg1—19 to 27 inches; dark grayish brown (10YR 4/2) silty clay; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; common distinct very dark grayish brown (2.5Y 3/2) organo-clay films on faces of peds; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Btg2—27 to 39 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; common faint very dark grayish brown (2.5Y 3/2) organo-clay films on faces of peds; few black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; many medium distinct light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

BCtg—39 to 46 inches; grayish brown (2.5Y 5/2) silt

loam; weak medium prismatic structure; friable; few faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

Cg—46 to 60 inches; 60 percent grayish brown (2.5Y 5/2) and 40 percent yellowish brown (10YR 5/6), stratified silty clay loam and sandy loam; massive; friable; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 24 to 50 inches
Thickness of the solum: 30 to 52 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Btg or Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—silty clay loam or silty clay

Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, loam, or sandy loam

189A—Martinton silt loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Summits and footslopes

Map Unit Composition

Martinton and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that do not have a subsurface layer
- Soils that have slopes of more than 2 percent
- Soils that contain till in the lower part of the profile
- Soils that contain less clay in the subsoil than the Martinton soil

Dissimilar soils:
- The poorly drained Milford soils on toeslopes

Properties and Qualities of the Martinton Soil

Parent material: Lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Milford Series

Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Milford silty clay loam, 0 to 2 percent slopes; at an elevation of 643 feet; 1,450 feet north and 70 feet east of the southwest corner of sec. 4, T. 26 N., R. 14 W., in Iroquois County, Illinois; USGS Gilman topographic quadrangle; lat. 40 degrees 45 minutes 24 seconds N.

and long. 87 degrees 57 minutes 29 seconds W., NAD 27:

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine and fine subangular and angular blocky structure; firm; many fine roots; slightly acid; abrupt smooth boundary.

A—9 to 18 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate and strong very fine subangular blocky structure; firm; common fine roots; slightly acid; clear smooth boundary.

BA—18 to 22 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; moderate fine and medium angular blocky structure; very firm; common fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; common medium prominent olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; common medium faint dark grayish brown (2.5Y 4/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bg1—22 to 31 inches; gray (5Y 5/1) silty clay loam; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular and subangular blocky; very firm; common fine roots; many distinct dark gray (5Y 4/1) pressure faces on faces of peds; few fine black (N 2.5/0) iron and manganese oxide concretions throughout; many medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; many medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bg2—31 to 42 inches; gray (5Y 5/1) clay loam; moderate coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm; few fine roots; common medium prominent dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bg3—42 to 50 inches; dark gray (5Y 4/1) silty clay loam stratified with thin bands of clay loam; moderate coarse prismatic structure parting to moderate coarse subangular and angular blocky; firm; few fine roots; many medium prominent dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

Cg—50 to 60 inches; gray (5Y 5/1) clay loam stratified with bands of fine sandy loam, silty clay loam, and silty clay; massive; firm; few fine roots; many coarse prominent yellowish brown (10YR 5/4 and 5/8) masses of iron accumulation in the matrix; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Depth to carbonates: More than 36 inches
Thickness of the solum: 36 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—silty clay loam or silty clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam, silty clay, or clay loam

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam, clay loam, silt loam, loam, or sandy loam

69A—Milford silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Toeslopes

Map Unit Composition

Milford and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that contain less clay or more clay in the subsoil than the Milford soil
- Soils that contain till in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Martinton soils on summits and footslopes
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Milford Soil

Parent material: Lacustrine deposits
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow

Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: High
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Mokena Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow in the upper part, very slow in the lower part
Landform: Ground moraines and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying outwash and till or lacustrine deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Mokena silt loam, 0 to 2 percent slopes; at an elevation of 636 feet; 1,980 feet south and 194 feet east of the northwest corner of sec. 7, T. 29 N., R. 12 W., in Kankakee County, Illinois; USGS Kankakee topographic quadrangle; lat. 41 degrees 00 minutes 53 seconds N. and long. 87 degrees 46 minutes 15 seconds W., NAD 27:

Ap—0 to 5 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak fine and medium granular structure; friable; common very fine and fine roots throughout; neutral; clear smooth boundary.
A—5 to 12 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to weak fine and medium granular; friable; common very fine and fine roots throughout; neutral; gradual wavy boundary.
AB—12 to 15 inches; 70 percent black (10YR 2/1) and 30 percent very dark grayish brown (10YR 3/2) loam; weak fine and medium subangular blocky structure parting to weak fine and medium granular; friable; few very fine and fine roots throughout; neutral; gradual wavy boundary.
Bt1—15 to 20 inches; olive brown (2.5Y 4/3) loam; moderate medium subangular blocky structure; firm; few very fine and fine roots throughout; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common prominent black (10YR 2/1) organic coatings in root channels; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; neutral; gradual wavy boundary.
Bt2—20 to 25 inches; light olive brown (2.5Y 5/3) loam; moderate medium subangular blocky structure; firm; few very fine roots throughout; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common prominent black (10YR 2/1) organic coatings in root channels; common medium black (N 2.5/0) manganese nodules throughout; common fine faint grayish brown (2.5Y 5/2) iron depletions in the matrix; neutral; gradual wavy boundary.
Bt3—25 to 32 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure; firm; few very fine roots throughout; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common medium black (N 2.5/0) manganese nodules throughout; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; slightly alkaline; gradual smooth boundary.
Bt4—32 to 38 inches; 50 percent yellowish brown (10YR 5/4) and 50 percent dark grayish brown (2.5Y 4/2) clay loam; weak medium and coarse angular blocky structure; firm; few very fine roots throughout; few fine distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common medium black (N 2.5/0) manganese nodules throughout; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; slightly alkaline; clear smooth boundary.
2Bt5—38 to 42 inches; gray (5Y 5/1) silty clay; weak fine and medium subangular blocky structure; very firm; few very fine and fine roots throughout; few prominent dark grayish brown (2.5Y 4/2) clay films

on faces of peds; common medium black (N 2.5/0) manganese nodules throughout; many medium prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 1 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Cd—42 to 60 inches; 80 percent gray (5Y 5/1) and 20 percent yellowish brown (10YR 5/4) silty clay; massive; very firm; few fine black (N 2.5/0) manganese nodules throughout; common medium light gray (2.5Y 7/1) carbonate concretions throughout; 2 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to till or lacustrine deposits: 30 to 50 inches
Depth to carbonates: 30 to 50 inches
Thickness of the solum: 30 to 60 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or loam

Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—2 to 4
Texture—loam, clay loam, sandy clay loam, or silty clay loam

2Bt horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay or clay
Content of gravel—less than 7 percent

2Cd horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 4
Texture—silty clay or clay
Content of gravel—less than 10 percent

295A—Mokena silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and lake plains
Position on the landform: Summits and footslopes

Map Unit Composition

Mokena and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that have slopes of more than 2 percent
- Soils that contain less clay in the lower part of the profile than the Mokena soil
- Soils that contain till beginning at a depth of less than 30 inches or more than 50 inches

Dissimilar soils:
- The poorly drained Bryce soils on toeslopes

Properties and Qualities of the Mokena Soil

Parent material: Thin mantle of loess or other silty material and the underlying outwash and till or lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 30 to 60 inches to dense material
Available water capacity: About 8.7 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Onarga Series

Drainage class: Well drained
Permeability: Moderate in the upper part, rapid in the lower part
Landform: Beach ridges and outwash plains
Parent material: Eolian deposits and/or outwash
Slope range: 2 to 5 percent

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon for MLRA 110

Onarga fine sandy loam, 2 to 5 percent slopes; at an elevation of 666 feet; 2,032 feet south and 33 feet west of the northeast corner of sec. 17, T. 26 N., R. 10 E., in Iroquois County, Illinois; USGS Onarga West topographic quadrangle; lat. 40 degrees 43 minutes 45 seconds N. and long. 88 degrees 05 minutes 12 seconds W., NAD 27:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; very friable; moderately acid; abrupt smooth boundary.

A—8 to 13 inches; very dark grayish brown (10YR 3/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; very friable; many fine roots; moderately acid; clear smooth boundary.

Bt1—13 to 23 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine prismatic structure parting to weak fine subangular blocky; friable; common fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2—23 to 29 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium prismatic structure parting to weak fine subangular blocky; very friable; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; very strongly acid; gradual smooth boundary.

BC—29 to 33 inches; brownish yellow (10YR 6/6) loamy fine sand; weak medium subangular blocky structure; very friable; few fine roots; strongly acid; clear wavy boundary.

C—33 to 60 inches; yellowish brown (10YR 5/6) and light yellowish brown (10YR 6/4), stratified loamy fine sand and fine sand; single grain; loose; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the solum: 27 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—fine sandy loam or sandy loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—fine sandy loam, loam, or sandy loam

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 6
Texture—stratified loamy fine sand, fine sand, fine sandy loam, loamy sand, sand, or sandy loam

150B—Onarga fine sandy loam, 2 to 5 percent slopes

Setting

Landform: Outwash plains and beach ridges
Position on the landform: Summits and backslopes

Map Unit Composition

Onarga and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 2 percent
- Soils that contain less clay in the subsoil than the Onarga soil
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that do not have a subsurface layer

Dissimilar soils:
- The somewhat poorly drained Ridgeville soils on summits and footslopes
- The poorly drained Selma soils on toeslopes

Properties and Qualities of the Onarga Soil

Parent material: Eolian deposits and/or outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Low
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: Low for steel and high for concrete

Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Moderately high

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

802B—Orthents, loamy, undulating

Setting

General description: This map unit consists of areas of disturbed soil material.
Landform: Outwash plains and ground moraines
Position on the landform: Summits and backslopes

Map Unit Composition

Orthents and similar soils: 95 percent
Dissimilar soils: 5 percent

Minor Components

Similar soils:
• Soils that contain more silt and less sand in the profile than the Orthents
• Soils that have a seasonal high water table at a depth of less than 3.5 feet
• Soils that contain carbonates at or near the surface

Dissimilar soils:
• The poorly drained Drummer soils on toeslopes

Properties and Qualities of the Orthents

Parent material: Fill material
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 3.5 to 5.0 feet (February through April)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: Moderate for steel and concrete
Potential for surface runoff: Medium
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

805B—Orthents, clayey, undulating

Setting

General description: This map unit consists of areas of disturbed soil material.
Landform: Leveled land, ground moraines, and lake plains
Position on the landform: Summits and backslopes

Map Unit Composition

Orthents and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
• Soils that contain less clay and more sand or silt in the profile than the Orthents
• Soils that have a seasonal high water table beginning at a depth of less than 2 feet or more than 3.5 feet
• Soils that contain carbonates at or near the surface

Dissimilar soils:
• The poorly drained Ashkum soils on toeslopes
• The very poorly drained Houghton soils on toeslopes
• The very poorly drained Peotone soils on toeslopes

Properties and Qualities of the Orthents

Parent material: Earthy fill
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 4.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Very high
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Very high

Hazard of water erosion: Moderate
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Ozaukee Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 20 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon for MLRA 110

Ozaukee silt loam, 2 to 4 percent slopes; at an elevation of 780 feet; 2,540 feet north and 2,200 feet east of the southwest corner of sec. 31, T. 39 N., R. 10 E., in Du Page County, Illinois; USGS Naperville topographic quadrangle; lat. 41 degrees 49 minutes 14 seconds N. and long. 88 degrees 08 minutes 18 seconds W., NAD 27:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, yellowish brown (10YR 5/4) dry; moderate very fine and fine granular structure; friable; many very fine and fine roots; neutral; clear smooth boundary.

BE—4 to 10 inches; brown (10YR 4/3) silt loam; weak thick platy structure parting to moderate fine subangular blocky; friable; many very fine roots; few distinct dark grayish brown (10YR 4/2) coatings on faces of peds; moderately acid; clear smooth boundary.

2Bt1—10 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; many distinct brown (10YR 4/3) clay films on faces of peds; 1 percent gravel; slightly acid; abrupt smooth boundary.

2Bt2—16 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organo-clay films and brown (10YR 4/3) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent gravel; neutral; clear smooth boundary.

2Bt3—21 to 27 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Bt4—27 to 33 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concentrations throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 8 percent gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

2BCt—33 to 39 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine and medium subangular blocky structure; firm; common very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concentrations throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 6 percent gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Cd—39 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; few very fine roots;

common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many medium white (10YR 8/1) carbonate concretions throughout; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 6 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of loess or silty material: Less than 18 inches
Depth to carbonates: 15 to 40 inches
Thickness of the solum: 20 to 40 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silty clay
Content of gravel—1 to 10 percent

2Cd horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 4
Texture—silty clay loam or clay loam
Content of gravel—3 to 15 percent

530B—Ozaukee silt loam, 2 to 4 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that contain less clay in the subsoil than the Ozaukee soil
- Soils that have a thicker, darker surface layer than that of the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of less than 2 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes
- The moderately well drained, clayey Orthents on summits and backslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: High
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

530D2—Ozaukee silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Shoulders and backslopes

Map Unit Composition

Ozaukee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that contain less clay in the subsoil than the Ozaukee soil
- Soils that are severely eroded
- Soils that have slopes of less than 6 percent or more than 12 percent

Dissimilar soils:
- The somewhat poorly drained Blount soils on footslopes and summits
- The moderately well drained Chatsworth soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity: About 7.0 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Very high
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

530E2—Ozaukee silt loam, 12 to 20 percent slopes, eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Ozaukee and similar soils: 97 percent
Dissimilar soils: 3 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that contain less clay in the subsoil than the Ozaukee soil
- Soils that have slopes of less than 12 percent or more than 20 percent
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet

Dissimilar soils:
- The poorly drained Sawmill soils on flood plains

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity: About 7 inches to a depth of 60 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Very high
Hazard of water erosion: High
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 4e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Parr Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part, moderately slow in the lower part
Landform: Ground moraines and end moraines

Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 5 to 10 percent

Taxonomic classification: Fine-loamy, mixed, active, mesic Oxyaquic Argiudolls
Taxadjunct features: The Parr soils in this survey area have a thinner mollic epipedon than is defined as the range for the series. These soils are classified as fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs.

Typical Pedon for MLRA 108

Parr clay loam, 5 to 10 percent slopes, severely eroded; at an elevation of 840 feet; 145 feet north and 1,100 feet west of the southeast corner of sec. 19, T. 24 N., R. 7 E., in Ford County, Illinois; USGS Sibley topographic quadrangle; lat. 40 degrees 30 minutes 55 seconds N. and long. 88 degrees 26 minutes 45 seconds W., NAD 27:

Ap—0 to 8 inches; mixed dark brown (10YR 3/3) and brown (10YR 4/3) clay loam, grayish brown (10YR 5/2) dry: weak very fine granular structure; friable; 3 percent gravel; strongly acid; abrupt smooth boundary.
Bt1—8 to 15 inches; olive brown (2.5Y 4/4) clay loam; moderate fine subangular blocky structure; friable; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; many distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 3 percent gravel; moderately acid; clear smooth boundary.
Bt2—15 to 25 inches; olive brown (2.5Y 4/4) clay loam; weak fine prismatic structure parting to moderate medium angular blocky; friable; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 3 percent gravel; slightly acid; clear smooth boundary.
BCt—25 to 37 inches; light olive brown (2.5Y 5/4) clay loam; moderate fine and medium prismatic structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 3 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
C—37 to 60 inches; light olive brown (2.5Y 5/4) loam; massive; firm; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix: 3 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of loess or other silty material: Less than 18 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3 in moderately eroded areas; 3 or 4 in severely eroded areas
Chroma—1 to 3 in moderately eroded areas; 2 to 4 in severely eroded areas
Texture—silt loam in moderately eroded areas; clay loam in severely eroded areas

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—4 to 6
Texture—clay loam or loam

C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture—clay loam or loam
Content of gravel—less than 15 percent

221C2—Parr silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Shoulders and backslopes

Map Unit Composition

Parr and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that have slopes of less than 5 percent or more than 10 percent
• Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
• Soils that contain carbonates beginning at a depth of less than 20 inches or more than 40 inches
• Soils that contain till beginning at a depth of more than 18 inches

Dissimilar soils:
• The somewhat poorly drained Raub soils on summits and footslopes
• The poorly drained Drummer soils on toeslopes

Properties and Qualities of the Parr Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

221C3—Parr clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes

Map Unit Composition

Parr and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 5 percent or more than 10 percent
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that contain carbonates beginning at a depth of less than 20 inches or more than 40 inches
- Soils that contain till beginning at a depth of more than 18 inches
- Soils that are only moderately eroded

Dissimilar soils:
- The somewhat poorly drained Raub soils on summits and footslopes
- The poorly drained Drummer soils on toeslopes

Properties and Qualities of the Parr Soil

Parent material: Till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: High
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 4e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Pella Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains and lake plains
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Pella silty clay loam, 0 to 2 percent slopes; at an elevation of 658 feet; 190 feet north and 2,225 feet west of the southeast corner of sec. 14, T. 27 N., R. 9 E., in Ford County, Illinois; USGS Piper City topographic quadrangle; lat. 40 degrees 48 minutes 25 seconds N. and long. 88 degrees 09 minutes 14 seconds W., NAD 27:

Ap—0 to 7 inches; black (N 2.5/0) silty clay loam, dark gray (N 4/0) dry; moderate very fine and fine granular structure; friable; slightly acid; abrupt smooth boundary.
A—7 to 12 inches; black (N 2.5/0) silty clay loam, dark gray (N 4/0) dry; moderate fine and very fine granular structure; friable; neutral; clear smooth boundary.
Bg1—12 to 20 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine and medium prismatic structure parting to moderate fine and very fine angular blocky; friable; few fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; neutral; clear smooth boundary.
Bg2—20 to 27 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine and medium prismatic structure parting to moderate fine and medium angular blocky; friable; common medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.
Bg3—27 to 33 inches; gray (5Y 6/1) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; friable; thin discontinuous very dark gray (10YR 3/1) krotovina; many medium prominent light olive brown (2.5Y 5/4) and common fine prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; gradual wavy boundary.
2BCg—33 to 42 inches; gray (5Y 6/1) silt loam with a high sand content; weak medium prismatic structure; friable; moderate medium prominent light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; moderately alkaline; gradual wavy boundary.
2Cg—42 to 60 inches; gray (5Y 6/1), stratified silt loam, loam, and sandy loam; massive; friable; many medium prominent light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 22 inches
Thickness of loess or other silty material: 20 to 40 inches
Depth to carbonates: 16 to 40 inches
Thickness of the solum: 30 to 50 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam
Content of gravel—1 to 10 percent

2Bg or 2BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 6
Texture—silt loam, loam, silty clay loam, or clay loam

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—silt loam, loam, sandy loam, or clay loam
Content of gravel—less than 15 percent

153A—Pella silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains and outwash plains
Position on the landform: Toeslopes

Map Unit Composition

Pella and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that contain carbonates beginning at a depth of more than 40 inches
• Soils that contain more clay in the subsoil than the Pella soil
• Soils that contain outwash beginning at a depth of less than 20 inches or more than 40 inches

Dissimilar soils:
• The somewhat poorly drained La Hogue and Ridgeville soils on summits and footslopes

Properties and Qualities of the Pella Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate

Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12 inches to a depth of 60 inches
Content of organic matter in the surface layer: 5 to 6 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Penfield Series

Drainage class: Well drained
Permeability: Moderate
Landform: Outwash plains and ground moraines
Parent material: Outwash
Slope range: 2 to 5 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon for MLRA 108

Penfield loam, 2 to 5 percent slopes; at an elevation of 685 feet; 910 feet south and 465 feet west of the northeast corner of sec. 30, T. 20 N., R. 14 W., in Champaign County, Illinois; USGS Royal topographic quadrangle; lat. 40 degrees 10 minutes 06 seconds N. and long. 87 degrees 58 minutes 50 seconds W., NAD 27:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.
Bt1—10 to 14 inches; brown (10YR 4/3) clay loam; moderate medium subangular blocky structure parting to moderate very fine subangular blocky; friable; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; neutral; clear smooth boundary.
Bt2—14 to 20 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine prismatic structure parting to moderate very fine angular blocky; firm; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; neutral; clear smooth boundary.
Bt3—20 to 31 inches; yellowish brown (10YR 5/4) clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; 5 percent fine gravel; neutral; abrupt smooth boundary.
Bt4—31 to 44 inches; 80 percent dark yellowish brown (10YR 4/4) sandy clay loam and 20 percent yellowish brown (10YR 5/6) fine sandy loam; moderate coarse prismatic structure parting to weak coarse angular blocky; friable; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; 5 percent fine gravel; neutral; clear smooth boundary.
Bt5—44 to 51 inches; yellowish brown (10YR 5/4) sandy clay loam; weak coarse prismatic structure parting to weak coarse angular blocky; friable; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; common medium black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; neutral; clear smooth boundary.
Btg—51 to 61 inches; 60 percent light brownish gray (10YR 6/2) and 40 percent yellowish brown (10YR 5/6) sandy clay loam; weak coarse prismatic structure parting to weak coarse angular blocky; friable; common distinct very dark gray (10YR 3/1) organo-clay films along root channels and pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; clear smooth boundary.
BCt—61 to 72 inches; strong brown (7.5YR 5/6), stratified fine sandy loam and sandy clay loam; weak coarse angular blocky structure; friable; common distinct very dark gray (10YR 3/1) organo-clay films along root channels and pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium faint yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium prominent light brownish gray (10YR 6/2) iron

depletions in the matrix; neutral; clear smooth boundary.
C—72 to 80 inches; yellowish brown (10YR 5/4 and 5/6) fine sandy loam; massive; very friable; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 35 to more than 80 inches
Thickness of the solum: 35 to more than 60 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—loam

Bt or Btg horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, loam, silt loam, sandy loam, or silty clay loam

BCt or BC horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—fine sandy loam, sandy loam, loam, sandy clay loam, or clay loam
Content of gravel—less than 10 percent

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—1 to 6
Texture—stratified loam, silt loam, very fine sandy loam, sandy loam, loamy sand, and fine sand
Content of gravel—less than 10 percent

687B—Penfield loam, 2 to 5 percent slopes

Setting

Landform: Ground moraines and outwash plains
Position on the landform: Summits and backslopes

Map Unit Composition

Penfield and similar soils: 95 percent
Dissimilar soils: 5 percent

Minor Components

Similar soils:
- Soils that have a thinner surface layer than that of the Penfield soil
- Soils that have slopes of less than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 6 feet
- Soils that contain less sand and more silt in the upper one-half of the profile than the Penfield soil

Dissimilar soils:
- The somewhat poorly drained La Hogue soils on summits and footslopes
- The poorly drained Drummer soils on toeslopes

Properties and Qualities of the Penfield Soil

Parent material: Outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.7 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): 3.5 to 6.0 feet (February through April)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: Moderate for steel and concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Peotone Series

Drainage class: Very poorly drained
Permeability: Moderately slow
Landform: Ground moraines
Parent material: Colluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Typical Pedon for MLRA 110

Peotone silty clay loam, 0 to 2 percent slopes; at an elevation of 707 feet; 315 feet south and 2,233 feet east of the northwest corner of sec. 21, T. 29 N., R. 9 E., in Ford County, Illinois; USGS Cabery topographic quadrangle; lat. 40 degrees 58 minutes 49 seconds N.

and long. 88 degrees 12 minutes 00 seconds W., NAD 27:

Ap—0 to 7 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
A—7 to 13 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
Bg1—13 to 27 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; moderate medium angular blocky structure; friable; common very fine roots; neutral; clear smooth boundary.
Bg2—27 to 41 inches; dark gray (10YR 4/1) silty clay; moderate fine prismatic structure; firm; common very fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; slightly alkaline; clear smooth boundary.
Bg3—41 to 50 inches; dark gray (10YR 4/1) silty clay; moderate medium prismatic structure; firm; few very fine roots; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; slightly alkaline; clear smooth boundary.
Cg—50 to 60 inches; dark gray (10YR 4/1) silty clay loam; massive; firm; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: More than 28 inches
Thickness of the solum: 38 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 3
Chroma—0 or 1
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam or silt loam

330A—Peotone silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Toeslopes

Map Unit Composition

Peotone and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
• Soils that are lighter colored in the upper one-half of the subsoil than the Peotone soil
• Soils that contain less clay in the subsurface layer and subsoil than the Peotone soil

Dissimilar soils:
• The somewhat poorly drained Elliott soils on summits and footslopes
• The very poorly drained, organic Houghton soils on toeslopes

Properties and Qualities of the Peotone Soil

Parent material: Colluvium
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 5 to 7 percent
Shrink-swell potential: High
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through June)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: None
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 2w

Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

865—Pits, gravel

General Description

• This map unit consists of nearly level and gently sloping areas from which gravel has been extracted. The pits have nearly vertical sidewalls. Some pits are active, and others have been abandoned. Some contain water.

Map Unit Composition

Pits, gravel: 92 percent
Dissimilar components: 8 percent

Minor Components

Dissimilar components:
• The well drained, loamy Orthents on summits and backslopes
• The poorly drained Drummer soils on toeslopes

Proctor Series

Drainage class: Well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Argiudolls
Taxadjunct features: The Proctor soil in map unit 148B2 has a thinner mollic epipedon than is defined as the range for the series. This soil is classified as a fine-silty, mixed, superactive, mesic Mollic Hapludalf.

Typical Pedon for MLRA 108

Proctor silt loam, 2 to 5 percent slopes; at an elevation of 705 feet; 204 feet north and 2,460 feet west of the southeast corner of sec. 3, T. 11 N., R. 6 E., in Peoria County, Illinois; USGS Princeville topographic quadrangle; lat. 40 degrees 57 minutes 37 seconds N. and long. 89 degrees 48 minutes 07 seconds W., NAD 27:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; moderately acid; clear smooth boundary.
A—8 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
Bt1—11 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; moderately acid; clear smooth boundary.
Bt2—16 to 23 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.
Bt3—23 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.
2Bt4—28 to 33 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; friable; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; moderately acid; clear smooth boundary.
2Bt5—33 to 46 inches; strong brown (7.5YR 5/6), stratified loam and sandy loam; weak coarse subangular blocky structure; very friable; few very fine roots; common faint brown (7.5YR 4/4) clay films on faces of peds; slightly acid; gradual smooth boundary.
2C—46 to 60 inches; strong brown (7.5YR 5/6), stratified sandy loam and loamy sand; massive; very friable; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: 20 to 40 inches
Depth to carbonates: More than 40 inches
Thickness of the solum: 40 to more than 65 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR or 10YR

Value—4 to 6
Chroma—3 to 6
Texture—clay loam, loam, silt loam, or sandy loam
Content of gravel—less than 10 percent

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—stratified sandy loam, loam, silt loam, or loamy sand
Content of gravel—less than 15 percent

148B—Proctor silt loam, 2 to 5 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and summits

Map Unit Composition

Proctor and similar soils: 87 percent
Dissimilar soils: 13 percent

Minor Components

Similar soils:
- Soils that do not have a subsurface layer
- Soils that contain outwash beginning at a depth of less than 20 inches
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer soils on toeslopes
- The somewhat poorly drained Brenton soils on summits and footslopes

Properties and Qualities of the Proctor Soil

Parent material: Loess and the underlying outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 4 percent
Shrink-swell potential: Moderate
Flooding: None
Accelerated erosion: Slight
Potential for frost action: High
Corrosivity: Moderate for steel and concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

148B2—Proctor silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and summits

Map Unit Composition

Proctor and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that contain outwash beginning at a depth of less than 20 inches
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer soils on toeslopes
- The somewhat poorly drained Brenton soils on summits and footslopes

Properties and Qualities of the Proctor Soil

Parent material: Loess and the underlying outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.1 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Corrosivity: Moderate for steel and concrete
Potential for surface runoff: Low

Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Rantoul Series

Drainage class: Very poorly drained
Permeability: Very slow
Landform: Ground moraines and lake plains
Parent material: Colluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Typical Pedon for MLRA 110

Rantoul silty clay, 0 to 2 percent slopes; at an elevation of 653 feet; 111 feet south and 1,612 feet east of the northwest corner of sec. 29, T. 30 N., R. 7 E., in Livingston County, Illinois; USGS Dwight topographic quadrangle; lat. 41 degrees 02 minutes 58 seconds N. and long. 88 degrees 27 minutes 03 seconds W., NAD 27:

Ap—0 to 8 inches; black (N 2.5/0) silty clay, dark gray (10YR 4/1) dry; moderate fine granular structure; firm; few very fine roots; neutral; abrupt smooth boundary.

A—8 to 17 inches; black (N 2.5/0) silty clay, dark gray (10YR 4/1) dry; moderate medium granular structure; firm; few very fine roots; few fine very dark brown (7.5YR 2/2) very weakly cemented iron and manganese oxide nodules throughout; neutral; clear smooth boundary.

Bg1—17 to 26 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; strong medium prismatic structure parting to strong fine and medium subangular blocky; firm; few very fine roots; many distinct black (N 2.5/0) organic coatings on faces of peds; few fine very dark brown (7.5YR 2/2) very weakly cemented iron and manganese oxide nodules throughout; few coarse prominent olive (5Y 4/3) and common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; neutral; clear smooth boundary.

Bg2—26 to 31 inches; dark gray (5Y 4/1) silty clay; strong medium prismatic structure parting to strong medium subangular blocky; firm; few very fine roots; many distinct very dark gray (5Y 3/1) organic coatings on faces of peds; few fine very dark brown (7.5YR 2/2) very weakly cemented iron and manganese oxide nodules throughout; common fine and medium prominent light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; neutral; clear smooth boundary.

Bg3—31 to 40 inches; gray (5Y 5/1) silty clay; strong medium prismatic structure parting to strong medium angular blocky; firm; few very fine roots; common distinct discontinuous dark gray (5Y 4/1) slickensides on faces of peds; few fine very dark brown (7.5YR 2/2) very weakly cemented iron and manganese oxide nodules throughout; few fine prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; 2 percent gravel; neutral; clear smooth boundary.

Bg4—40 to 47 inches; 60 percent gray (5Y 5/1) and 40 percent dark gray (5Y 4/1) silty clay; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; firm; few very fine roots; common faint discontinuous dark gray (5Y 4/1) slickensides on faces of peds; few fine very dark brown (7.5YR 2/2) very weakly cemented iron and manganese oxide nodules throughout; common fine prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; 3 percent gravel; slightly alkaline; abrupt smooth boundary.

BCg—47 to 60 inches; 75 percent gray (5Y 5/1) and 25 percent yellowish brown (10YR 5/6) silty clay; weak coarse prismatic structure parting to weak coarse angular blocky; very firm; common faint dark gray (5Y 4/1) slickensides on vertical faces of peds; few fine very dark brown (7.5YR 2/2) very weakly cemented iron and manganese oxide nodules throughout; 3 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: 34 to 60 inches
Thickness of the solum: 36 to 70 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 1
Texture—silty clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 5
Chroma—0 to 2
Texture—silty clay or clay

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay, silty clay loam, or clay

238A—Rantoul silty clay, 0 to 2 percent slopes

Setting

Landform: Ground moraines and lake plains
Position on the landform: Toeslopes

Map Unit Composition

Rantoul and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that are lighter colored in the upper part of the subsoil than the Rantoul soil
• Soils that contain less clay in the subsoil than the Rantoul soil

Dissimilar soils:
• The somewhat poorly drained Clarence soils on summits and footslopes
• The very poorly drained, organic Houghton soils on toeslopes

Properties and Qualities of the Rantoul Soil

Parent material: Colluvium
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 7 percent
Shrink-swell potential: High
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through June)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: None
Potential for frost action: High
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

Raub Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon for MLRA 108

Raub silt loam, 0 to 2 percent slopes; at an elevation of about 680 feet; about 2,550 feet north and 1,690 feet east of the southwest corner of sec. 19, T. 20 N., R. 14 W., in Champaign County, Illinois; USGS Royal topographic quadrangle; lat. 40 degrees 10 minutes 40 seconds N. and long. 87 degrees 59 minutes 18 seconds W., NAD 27:

Ap—0 to 10 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and very fine subangular blocky structure; friable; slightly acid; clear smooth boundary.
A—10 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; friable; slightly acid; clear smooth boundary.
Bt1—18 to 22 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organo-clay films lining pores; many distinct grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct and prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; moderately acid; abrupt smooth boundary.
Bt2—22 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; strong fine and medium angular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct dark grayish brown (10YR 4/2) and few fine faint brown (10YR 5/3) iron depletions in the matrix; slightly acid; clear smooth boundary.

2Bt3—32 to 40 inches; yellowish brown (10YR 5/4) clay loam; weak medium subangular blocky structure; firm; common distinct black (10YR 2/1) organo-clay films lining root channels; many medium irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few coarse prominent light olive gray (5Y 6/2) iron depletions in the matrix; 2 percent fine gravel; neutral; clear smooth boundary.

2BC—40 to 50 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse subangular blocky structure; firm; common fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium distinct gray (10YR 5/1) iron depletions in the matrix; 2 percent fine gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2C—50 to 60 inches; yellowish brown (10YR 5/4) and gray (5Y 6/1) loam; massive; firm; common fine distinct and prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent fine gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: 22 to 40 inches
Depth to carbonates: 40 to 65 inches
Thickness of the solum: 40 to 70 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—2 to 6
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, loam, or silt loam
Content of gravel—less than 10 percent

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 4
Texture—loam, clay loam, or silt loam
Content of gravel—3 to 10 percent

481A—Raub silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Footslopes and summits

Map Unit Composition

Raub and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that have slopes of more than 2 percent
- Soils that contain carbonates beginning at a depth of less than 40 inches
- Soils that do not have a subsurface layer and have a thinner surface layer than that of the Raub soil
- Soils that contain till at a depth of less than 22 inches

Dissimilar soils:
- The poorly drained Drummer soils on toeslopes
- The moderately well drained, sloping Parr soils on backslopes

Properties and Qualities of the Raub Soil

Parent material: Loess and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Low
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Ridgeville Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part, rapid in the lower part
Landform: Beach ridges and outwash plains
Parent material: Eolian deposits and/or outwash
Slope range: 0 to 2 percent

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Ridgeville fine sandy loam, 0 to 2 percent slopes; at an elevation of 653 feet; 2,084 feet south and 30 feet east of the northwest corner of sec. 19, T. 26 N., R. 12 W., in Iroquois County, Illinois; USGS Woodworth topographic quadrangle; lat. 40 degrees 43 minutes 24 seconds N. and long. 87 degrees 45 minutes 54 seconds W., NAD 27:

Ap—0 to 8 inches; very dark brown (10YR 2/2) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine and medium granular structure; very friable; slightly acid; gradual smooth boundary.
A—8 to 16 inches; very dark gray (10YR 3/1) fine sandy loam, dark grayish brown (10YR 4/2) dry; weak fine and medium granular structure; very friable; moderately acid; clear wavy boundary.
BA—16 to 25 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure in the upper 4 inches grading to weak very fine and fine subangular blocky in the lower part; friable; common fine faint brown (10YR 5/3) masses of iron accumulation and dark gray (10YR 4/1) iron depletions in the matrix; moderately acid; clear smooth boundary.
Bt1—25 to 32 inches; grayish brown (10YR 5/2) sandy clay loam; moderate fine and medium subangular blocky structure; firm; few distinct gray (10YR 5/1) clay films on faces of peds; few fine dark brown (7.5YR 3/2) iron and manganese oxide concretions throughout; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.
Bt2—32 to 40 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium subangular blocky structure; friable; common distinct gray (10YR 5/1) clay films on faces of peds; many fine dark brown (7.5YR 3/2) iron and manganese oxide concretions throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
BC—40 to 47 inches; yellowish brown (10YR 5/8) loamy fine sand; weak moderate subangular blocky structure; very friable; few fine dark brown (7.5YR 3/2) iron and manganese oxide concretions throughout; many medium prominent light brownish gray (10YR 6/2) iron depletions in the matrix; neutral; clear wavy boundary.
Cg—47 to 60 inches; light brownish gray (10YR 6/2) fine sand; single grain; loose; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the solum: 35 to 55 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—fine sandy loam or loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—sandy loam, loam, sandy clay loam, or fine sandy loam

Cg horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 8
Texture—fine sand, sand, loamy sand, or fine sandy loam
Content of gravel—less than 7 percent

151A—Ridgeville fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and beach ridges
Position on the landform: Summits and footslopes

Map Unit Composition

Ridgeville and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of more than 2 percent
- Soils that do not have a subsurface layer
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that contain more clay in the subsoil than the Ridgeville soil

Dissimilar soils:
- The poorly drained Selma soils on toeslopes
- The well drained Onarga soils on summits and backslopes

Properties and Qualities of the Ridgeville Soil

Parent material: Eolian deposits and/or outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Low
Apparent seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: Moderate for steel and concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Moderately high

Interpretive Groups

Land capability classification: 2s
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Rowe Series

Drainage class: Poorly drained
Permeability: Very slow
Landform: Ground moraines and lake plains
Parent material: Colluvium or lacustrine deposits and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Vertic Argiaquolls

Typical Pedon for MLRA 110

Rowe silty clay loam, 0 to 2 percent slopes; at an elevation of 790 feet; 149 feet north and 432 feet west of the southeast corner of sec. 31, T. 24 N., R. 10 E., in Iroquois County, Illinois; USGS Paxton topographic quadrangle; lat. 40 degrees 29 minutes 18 seconds N. and long. 88 degrees 05 minutes 59 seconds W., NAD 27:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; abrupt smooth boundary.

A—7 to 14 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium and fine subangular blocky structure parting to moderate fine granular; friable; very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

2Btg1—14 to 20 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium and fine subangular blocky structure; friable; few fine roots; many distinct dark gray (10YR 4/1) clay films and very dark gray (10YR 3/1) organic coatings on faces of peds; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

2Btg2—20 to 29 inches; grayish brown (2.5Y 5/2) clay; moderate coarse and medium prismatic structure parting to moderate medium and fine angular blocky; firm; few fine roots; common very dark gray (10YR 3/1) organic coatings on faces of peds; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common distinct dark gray (10YR 4/1) slickensides on faces of peds; common fine prominent yellowish brown (10YR 5/8) and light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

2Btg3—29 to 40 inches; grayish brown (2.5Y 5/2) silty clay; moderate coarse and medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; few very dark gray (10YR 3/1) organic coatings along root channels; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common distinct dark grayish brown (2.5Y 4/2) slickensides on faces of peds; common fine prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; slightly alkaline; gradual smooth boundary.

2BCg—40 to 48 inches; grayish brown (2.5Y 5/2) silty

clay; moderate coarse and medium prismatic structure; very firm; common faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine white (10YR 8/1) soft masses of calcium carbonate throughout; many medium prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; common fine faint gray (5Y 5/1) iron depletions in the matrix; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Cg—48 to 63 inches; yellowish brown (10YR 5/6), gray (5Y 5/1), and dark grayish brown (2.5Y 4/2) silty clay; massive; very firm; few fine very dark brown (10YR 2/2) very weakly cemented iron and manganese oxide nodules throughout; common fine white (10YR 8/1) soft masses of calcium carbonate throughout; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 25 to 55 inches
Thickness of the solum: 30 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 4
Texture—silty clay or clay

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay or clay

230A—Rowe silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains and ground moraines
Position on the landform: Toeslopes

Map Unit Composition

Rowe and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
• Soils that contain less clay in the subsoil than the Rowe soil
• Soils that are darker in the upper one-half of the subsoil than the Rowe soil

Dissimilar soils:
• The somewhat poorly drained Clarence soils on summits and footslopes
• The very poorly drained Rantoul soils on toeslopes

Properties and Qualities of the Rowe Soil

Parent material: Colluvium or lacustrine deposits and the underlying till
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 6.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: High
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

Rutland Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow in the upper part, very slow in the lower part
Landform: Ground moraines and lake plains
Parent material: Loess or other silty material and the underlying till or lacustrine deposits
Slope range: 0 to 5 percent

Taxonomic classification: Fine, smectitic, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Rutland silty clay loam, 0 to 2 percent slopes; at an elevation of 730 feet; 168 feet north and 480 feet east of the southwest corner of sec. 34, T. 28 N., R. 2 E., in Woodford County, Illinois; USGS Flanagan SW topographic quadrangle; lat. 40 degrees 50 minutes 23 seconds N. and long. 88 degrees 59 minutes 10 seconds W., NAD 27:

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak very fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

A—8 to 14 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine granular structure; friable; common fine roots; moderately acid; clear wavy boundary.

Bt1—14 to 20 inches; brown (10YR 4/3) silty clay; strong fine subangular blocky structure; friable; common fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings and common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; few fine faint grayish brown (2.5Y 5/2) iron depletions in the matrix; moderately acid; gradual wavy boundary.

Bt2—20 to 28 inches; olive brown (2.5Y 4/4) silty clay loam; moderate fine prismatic structure parting to strong fine subangular blocky; firm; common fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; slightly acid; gradual wavy boundary.

Bt3—28 to 36 inches; olive brown (2.5Y 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; slightly acid; gradual wavy boundary.

Bt4—36 to 44 inches; yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) silt loam; moderate medium and coarse prismatic structure; firm; few very fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; neutral; clear wavy boundary.

2Bk—44 to 52 inches; olive brown (2.5Y 4/4) silty clay; moderate coarse prismatic structure; very firm; many distinct light brownish gray (2.5Y 6/2) calcium carbonate coatings along vertical faces of peds; common medium light gray (10YR 7/2) soft masses of calcium carbonate throughout; 1 percent fine gravel; strongly effervescent; moderately alkaline; diffuse wavy boundary.

2Cd—52 to 60 inches; olive brown (2.5Y 4/4) clay; massive; very firm; many distinct light brownish gray (2.5Y 6/2) calcium carbonate coatings along vertical cleavage planes; 1 percent fine gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of loess or other silty material: 35 to 55 inches
Depth to carbonates: 30 to 50 inches
Thickness of the solum: 40 to 60 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam

Bt horizon:
Hue—10YR, 2.5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Bt, 2BC, or 2Bk horizon:
Hue—10YR to 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay or clay

2Cd horizon:
Hue—10YR to 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay or clay

375A—Rutland silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and lake plains
Position on the landform: Summits and footslopes

Map Unit Composition

Rutland and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that contain less clay in the subsoil than the Rutland soil
- Soils that have slopes of more than 2 percent
- Soils that contain till or lacustrine deposits at a depth of less than 35 inches

Dissimilar soils:
- The poorly drained Bryce soils on toeslopes

Properties and Qualities of the Rutland Soil

Parent material: Loess or other silty material and the underlying till or lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 40 to 60 inches to dense material
Available water capacity: About 10.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

375B—Rutland silty clay loam, 2 to 5 percent slopes

Setting

Landform: Ground moraines and lake plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Rutland and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that contain less clay in the subsoil than the Rutland soil
- Soils that have a thinner subsurface layer than that of the Rutland soil
- Soils that have slopes of less than 2 percent
- Soils that contain till or lacustrine deposits at a depth of less than 35 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Bryce soils on toeslopes

Properties and Qualities of the Rutland Soil

Parent material: Loess or other silty material and the underlying till or lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 40 to 60 inches to dense material
Available water capacity: About 9.6 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: High
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Sawmill Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls

Typical Pedon for MLRA 108

Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded; at an elevation of 535 feet; 300 feet south and 750 feet east of the northwest corner of sec. 20, T. 15 N., R. 4 W., in Sangamon County, Illinois; USGS New City topographic quadrangle; lat. 39 degrees 44 minutes 34 seconds N. and long. 89 degrees 34 minutes 15 seconds W., NAD 27:

Ap—0 to 10 inches; very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) silty clay loam, gray (10YR 5/1) dry; weak fine subangular blocky structure; firm; few fine roots; few subrounded pebbles 1 to 3 mm in diameter; slightly acid; clear smooth boundary.

A1—10 to 17 inches; black (10YR 2/1) and very dark grayish brown (10YR 3/2) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; firm; few fine roots; few subrounded pebbles 1 to 3 mm in diameter; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

A2—17 to 25 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium angular blocky structure; firm; few fine roots; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

AB—25 to 32 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium prismatic structure parting to moderate fine subangular blocky; firm; few fine roots; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bg—32 to 40 inches; dark gray (10YR 4/1) silty clay loam; weak medium prismatic structure parting to moderate fine and medium angular blocky; firm; common faint discontinuous very dark gray (10YR 3/1) organic coatings on faces of peds; few fine roots; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Btg1—40 to 49 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; firm; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese accumulations with diffuse boundaries lining root channels and pores; few fine prominent strong brown (7.5YR 5/6) and common fine distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Btg2—49 to 58 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure; firm; thin continuous gray (10YR 5/1) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide accumulations with diffuse boundaries lining pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Cg—58 to 65 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; very dark gray (10YR 3/1) channel linings and fillings; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation lining pores; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: More than 48 inches
Thickness of the solum: 36 to 60 inches

Ap or A horizon:
- Hue—10YR, 2.5Y, 5Y, or N
- Value—2 to 3
- Chroma—0 to 2
- Texture—silty clay loam

Bg or Btg horizon:
- Hue—10YR, 2.5Y, or 5Y
- Value—3 to 6
- Chroma—1 or 2
- Texture—silty clay loam, clay loam, loam, or silt loam

Cg horizon:
- Hue—10YR, 2.5Y, or 5Y
- Value—4 to 6
- Chroma—1 or 2
- Texture—silty clay loam, clay loam, silt loam, or loam

3107A—Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Sawmill and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that contain more clay throughout than the Sawmill soil
- Soils that contain more sand in the subsoil than the Sawmill soil
- Soils that are subject to only occasional flooding
- Soils that are darker in the upper part of the subsoil than the Sawmill soil

Dissimilar soils:
- Somewhat poorly drained, silty soils in the higher positions

Properties and Qualities of the Sawmill Soil

Parent material: Alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity: About 12.3 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 5 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding is most likely (frequency, months): Frequent (November through June)
Accelerated erosion: None
Potential for frost action: High
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Hydric

Selma Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Selma loam, 0 to 2 percent slopes; at an elevation of 656 feet; 52 feet south and 160 feet west of the northeast corner of sec. 18, T. 28 N., R. 10 E., in Iroquois County, Illinois; USGS Piper City NE topographic quadrangle; lat. 40 degrees 54 minutes 35 seconds N. and long. 88 degrees 06 minutes 43 seconds W., NAD 27:

Ap—0 to 6 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine and medium granular structure; friable; common very fine and fine roots; neutral; gradual smooth boundary.
A—6 to 13 inches; black (10YR 2/1) clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; friable; common fine roots; neutral; gradual wavy boundary.
Btg1—13 to 19 inches; dark grayish brown (2.5Y 4/2) clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; many prominent very dark gray (2.5Y 3/1) organo-clay films on faces of peds and in pores; few fine distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.
Btg2—19 to 28 inches; grayish brown (2.5Y 5/2) loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; many prominent dark gray (2.5Y 4/1) clay films on faces of peds; few fine light olive brown (2.5Y 5/4) iron and manganese nodules throughout; common medium distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; slightly alkaline; gradual wavy boundary.
Btg3—28 to 39 inches; grayish brown (2.5Y 5/2) loam; weak fine and medium subangular blocky structure; friable; common fine roots; few distinct

dark gray (2.5Y 4/1) clay films on faces of peds; black (N 2.5/0) krotovina from a depth of 30 inches to a depth of 39 inches; few fine dark yellowish brown (10YR 4/6) iron and manganese nodules throughout; few fine prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; slightly alkaline; gradual wavy boundary.

BCtg—39 to 44 inches; grayish brown (2.5Y 5/2) loam; weak medium subangular blocky structure; friable; few very fine roots; few faint dark gray (2.5Y 4/1) clay films on faces of peds; few fine dark yellowish brown (10YR 4/6) iron and manganese nodules throughout; few fine prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline; gradual wavy boundary.

Cg1—44 to 54 inches; 55 percent dark gray (2.5Y 4/1), 35 percent gray (2.5Y 5/1), and 10 percent light yellowish brown (2.5Y 6/4), stratified sandy loam and loamy sand; massive in the sandy loam and single grain in the loamy sand; friable in the sandy loam and loose in the loamy sand; few very fine roots; very strongly effervescent; moderately alkaline; gradual wavy boundary.

Cg2—54 to 80 inches; 45 percent dark gray (2.5Y 4/1), 45 percent gray (2.5Y 5/1), and 10 percent light olive brown (2.5Y 5/6), stratified silt loam, sandy loam, and loamy sand; massive in the silt loam and sandy loam and single grain in the loamy sand; friable; few very fine roots; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: More than 30 inches
Thickness of the solum: 35 to 55 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam or clay loam

Bg, Btg, or BCg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—loam, clay loam, silt loam, or sandy loam
Content of gravel—less than 10 percent

Cg or C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—stratified sandy loam, loam, silt loam, or loamy sand
Content of gravel—less than 15 percent

125A—Selma loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes

Map Unit Composition

Selma and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that contain less sand and more silt in the upper one-half of the profile than the Selma soil
- Soils that contain till in the lower part of the profile
- Soils that have a thicker dark surface soil than that of the Selma soil and are darker in the upper part of the subsoil

Dissimilar soils:
- The somewhat poorly drained La Hogue soils on summits and footslopes
- The poorly drained, calcareous Harpster soils on toeslopes
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Selma Soil

Parent material: Outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity: About 10.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding: None
Accelerated erosion: Negligible
Potential for frost action: High
Corrosivity: High for steel and low for concrete

Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Swygert Series

Drainage class: Somewhat poorly drained
Permeability: Slow in the upper part, very slow in the lower part
Landform: Ground moraines and glacial lakes (relict)
Parent material: Thin mantle of loess or other silty material and the underlying lacustrine deposits and till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, mixed, active, mesic Aquic Argiudolls
Taxadjunct features: The Swygert soil in map unit 91B2 has a thinner mollic epipedon than is defined as the range for the series. This soil is classified as a fine, mixed, active, mesic Aquollic Hapludalf.

Typical Pedon for MLRA 110

Swygert silty clay loam, 0 to 2 percent slopes; at an elevation of 675 feet; 339 feet south and 66 feet east of the northwest corner of sec. 7, T. 25 N., R. 13 W., in Iroquois County, Illinois; USGS Onarga East topographic quadrangle; lat. 40 degrees 38 minutes 36 seconds N. and long. 87 degrees 53 minutes 02 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine granular structure; friable; many fine roots; slightly acid; abrupt wavy boundary.
A—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium angular blocky structure parting to weak fine subangular blocky; friable; many fine roots; common black (N 2.5/0) krotovinas; slightly acid; abrupt smooth boundary.
Bt1—12 to 18 inches; very dark grayish brown (10YR 3/2) silty clay, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; many fine roots; many distinct black (10YR 2/1) and very dark gray (10YR 3/1) organo-clay films on faces of peds; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine faint brown (10YR 4/3) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
Bt2—18 to 26 inches; brown (10YR 4/3) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; many distinct very dark grayish brown (10YR 3/2) organo-clay films and dark grayish brown (10YR 4/2) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation and olive gray (5Y 5/2) iron depletions in the matrix; neutral; clear smooth boundary.
Bt3—26 to 31 inches; yellowish brown (10YR 5/4) silty clay; moderate medium prismatic structure parting to weak medium and fine angular blocky; firm; common fine roots; common distinct very dark gray (10YR 3/1) organo-clay films in root channels; common very dark gray (10YR 3/1) krotovinas; common distinct dark gray (10YR 4/1) and gray (10YR 5/1) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine prominent gray (5Y 5/1) iron depletions in the matrix; slightly effervescent (7 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.
2Bt4—31 to 41 inches; light olive brown (2.5Y 5/4) silty clay; moderate medium prismatic structure parting to weak coarse angular blocky; very firm; few fine roots; common prominent very dark gray (10YR 3/1) organo-clay films and gray (5Y 5/1) clay films on faces of peds; common medium prominent gray (5Y 5/1) iron depletions in the matrix; slightly effervescent (16 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.
2Bt5—41 to 51 inches; light olive brown (2.5Y 5/4) silty clay; weak coarse prismatic structure; very firm; few fine roots; common distinct very dark gray (5Y 3/1) organo-clay films in root channels; many distinct dark gray (5Y 4/1) clay films on faces of peds; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; few fine distinct olive (5Y 5/6) and few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine prominent gray (5Y 5/1) iron depletions in the matrix; strongly effervescent (18 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.
2Cd—51 to 60 inches; brown (10YR 5/3) silty clay; massive; very firm; many distinct gray (5Y 6/1) pressure faces; common fine black (10YR 2/1) iron and manganese oxide concretions

throughout; few coarse prominent strong brown (7.5YR 5/6 and 5/8) masses of iron accumulation in the matrix; strongly effervescent (19 percent calcium carbonate equivalent); moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to till: Less than 45 inches
Depth to carbonates: 20 to 50 inches
Thickness of the solum: 35 to 55 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam

Bt or 2Bt horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 to 6
Texture—silty clay or clay

2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay, silty clay loam, or clay

91A—Swygert silty clay loam, 0 to 2 percent slopes

Setting

Landform: Glacial lakes (relict) and ground moraines
Position on the landform: Summits and footslopes

Map Unit Composition

Swygert and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
• Soils that contain less clay in the subsoil than the Swygert soil
• Soils that have slopes of more than 2 percent
• Soils that have a thinner subsurface layer than that of the Swygert soil

Dissimilar soils:
• The poorly drained Bryce soils on toeslopes

Properties and Qualities of the Swygert Soil

Parent material: Thin mantle of loess or other silty material and the underlying lacustrine deposits and till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 35 to 55 inches to dense material
Available water capacity: About 6.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

91B2—Swygert silty clay loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines and glacial lakes (relict)
Position on the landform: Footslopes and backslopes

Map Unit Composition

Swygert and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
• Soils that contain less clay in the subsoil than the Swygert soil
• Soils that have slopes of less than 2 percent or more than 4 percent
• Soils that are only slightly eroded
• Soils that contain carbonates at a depth of less than 20 inches

Dissimilar soils:
• The poorly drained Bryce soils on toeslopes

Properties and Qualities of the Swygert Soil

Parent material: Thin mantle of loess or other silty

material and the underlying lacustrine deposits and till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 35 to 55 inches to dense material
Available water capacity: About 6.2 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 1 to 2 feet (January through May)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: High
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Symerton Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part, slow in the lower part
Landform: Ground moraines and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying outwash and till or lacustrine deposits
Slope range: 2 to 5 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon for MLRA 110

Symerton silt loam, 2 to 5 percent slopes; at an elevation of 714 feet; 102 feet north and 1,806 feet west of the southeast corner of sec. 33, T. 24 N., R. 12 W., in Iroquois County, Illinois; USGS Hoopeston topographic quadrangle; lat. 40 degrees 29 minutes 17 seconds N. and long. 87 degrees 42 minutes 43 seconds W., NAD 27:

Ap—0 to 10 inches; black (10YR 2/1) silt loam, very dark gray (10YR 3/1) dry; weak very fine granular structure; firm; slightly acid; abrupt smooth boundary.
A—10 to 15 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate very fine granular structure; friable; moderately acid; clear smooth boundary.
AB—15 to 19 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate very fine granular structure; friable; many distinct black (10YR 2/1) organic coatings on faces of peds; moderately acid; clear smooth boundary.
2Bt1—19 to 25 inches; brown (10YR 4/3) gravelly clay loam; moderate very fine subangular blocky structure; firm; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide nodules throughout; about 18 percent gravel; moderately acid; clear smooth boundary.
2Bt2—25 to 31 inches; brown (10YR 4/3) gravelly clay loam; moderate fine subangular blocky structure; firm; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide nodules throughout; about 18 percent gravel; neutral; clear smooth boundary.
2Bt3—31 to 35 inches; yellowish brown (10YR 5/4) gravelly loam; weak fine and medium subangular blocky structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide nodules throughout; few fine prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; about 18 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
3Bt4—35 to 39 inches; brown (10YR 5/3) silt loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; few distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.
3C—39 to 60 inches; light olive brown (2.5Y 5/4) and light yellowish brown (2.5Y 6/4) silt loam; massive; firm; few fine prominent yellowish red (5YR 4/8) masses of iron accumulation in the matrix; few fine prominent gray (10YR 5/1) iron depletions in the matrix; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to till: 22 to 50 inches
Depth to carbonates: 24 to 55 inches

Thickness of the solum: 30 to 50 inches

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam or loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—clay loam, silty clay loam, sandy clay loam, loam, or the gravelly analogs of these textures
Content of gravel—less than 20 percent

3Bt or 3BC horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silt loam

3C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam or silt loam

294B—Symerton silt loam, 2 to 5 percent slopes

Setting

Landform: Ground moraines and lake plains
Position on the landform: Summits and backslopes

Map Unit Composition

Symerton and similar soils: 96 percent
Dissimilar soils: 4 percent

Minor Components

Similar soils:
• Soils that contain less sand and more clay in the upper part of the subsoil than the Symerton soil
• Soils that have slopes of less than 2 percent or more than 5 percent
• Soils that do not have a subsurface layer and have a thinner surface layer than that of the Symerton soil
• Soils that have a seasonal high water table at a depth of less than 2 feet or more than 3.5 feet
• Soils that contain till beginning at a depth of less than 22 inches or more than 50 inches

Dissimilar soils:
• The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Symerton Soil

Parent material: Thin mantle of loess or other silty material and the underlying outwash and till or lacustrine deposits
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 7.9 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2.5 to 4.0 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: Slight
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Varna Series

Drainage class: Moderately well drained
Permeability: Moderately slow in the upper part, slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 6 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Argiudolls
Taxadjunct features: The Varna soil in map unit 223C2 has a thinner mollic epipedon than is defined as the range for the series. This soil is classified as a fine, illitic, mesic Oxyaquic Hapludalf.

Typical Pedon for MLRA 110

Varna silt loam, 2 to 4 percent slopes, eroded; at an elevation of about 730 feet; 850 feet south and 150 feet east of the northwest corner of sec. 31, T. 29 N., R. 9 E., in Ford County, Illinois; USGS Cabery topographic quadrangle; lat. 40 degrees 56 minutes 56

seconds N. and long. 88 degrees 14 minutes 43 seconds W., NAD 27:

Ap—0 to 12 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; mixed with dark yellowish brown (10YR 4/4) fragments of subsoil material; moderate fine and medium granular structure; friable; neutral; abrupt smooth boundary.

2Bt1—12 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium angular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

2Bt2—18 to 27 inches; olive brown (2.5Y 4/4) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct light olive gray (5Y 6/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

2Bt3—27 to 39 inches; olive brown (2.5Y 4/4) silty clay loam; moderate medium prismatic structure; firm; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; many medium distinct light olive gray (5Y 6/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Cd—39 to 60 inches; mottled light olive brown (2.5Y 5/4), light gray (5Y 6/1), and yellowish brown (10YR 5/6) silty clay loam; massive; very firm; common greenish gray (5GY 6/1) pressure faces; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 16 inches
Thickness of loess or other silty material: Less than 20 inches
Depth to carbonates: 24 to 42 inches
Thickness of the solum: 24 to 60 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam or silty clay

Cd or 2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam, silty clay, or clay loam

223B2—Varna silt loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Varna and similar soils: 94 percent
Dissimilar soils: 6 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that contain less clay in the subsoil than the Varna soil
- Soils that are only slightly eroded
- Soils that have a seasonal high water table beginning at a depth of less than 2 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Varna Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity: About 8.4 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: High
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and low for concrete
Potential for surface runoff: Medium
Hazard of water erosion: Slight
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

223C2—Varna silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Shoulders and backslopes

Map Unit Composition

Varna and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that contain less clay in the subsoil than the Varna soil
- Soils that are severely eroded
- Soils that have a seasonal high water table beginning at a depth of less than 2 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes
- The somewhat poorly drained Elliott soils on summits and footslopes
- The moderately well drained Chatsworth soils on backslopes

Properties and Qualities of the Varna Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity: About 8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Perched seasonal high water table is highest (depth, months): 2.0 to 3.5 feet (February through April)
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: High
Hazard of water erosion: Moderate
Hazard of wind erosion: Slight

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Zook Series

Drainage class: Poorly drained
Permeability: Slow
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Typical Pedon for MLRA 110

Zook silty clay, 0 to 2 percent slopes, frequently flooded; at an elevation of 668 feet; 1,622 feet south and 96 feet east of the northwest corner of sec. 5, T. 25 N., R. 10 E., in Iroquois County, Illinois; USGS Onarga West topographic quadrangle; lat. 40 degrees 40 minutes 22 seconds N. and long. 88 degrees 06 minutes 09 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay, very dark gray (10YR 3/1) dry; moderate fine and medium granular structure; firm; many fine roots; neutral; abrupt smooth boundary.
A1—7 to 12 inches; black (10YR 2/1) silty clay, very dark gray (10YR 3/1) dry; moderate medium granular structure; firm; many fine roots; neutral; clear smooth boundary.
A2—12 to 18 inches; black (10YR 2/1) silty clay, very dark gray (10YR 3/1) dry; moderate fine and medium subangular blocky structure; firm; many fine roots; neutral; gradual smooth boundary.
A3—18 to 27 inches; black (5Y 2.5/1) silty clay, very dark gray (10YR 3/1) dry; moderate medium subangular blocky structure; firm; common fine roots; many faint black (10YR 2/1) organic coatings on faces of peds; few fine faint olive gray (5Y 4/2) iron depletions in the matrix; slightly alkaline; clear smooth boundary.
Bg1—27 to 33 inches; black (5Y 2.5/1) silty clay, very dark gray (10YR 3/1) dry; moderate fine and

medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Bg2—33 to 39 inches; black (5Y 2.5/1) silty clay, very dark gray (10YR 3/1) dry; moderate medium prismatic structure; firm; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine faint olive gray (5Y 4/2) iron depletions in the matrix; slightly alkaline; gradual smooth boundary.

Bg3—39 to 48 inches; very dark gray (5Y 3/1) silty clay, very dark gray (10YR 3/1) dry; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; slightly alkaline; gradual smooth boundary.

Bg4—48 to 53 inches; dark gray (5Y 4/1) silty clay; moderate fine prismatic structure; firm; many faint dark gray (5Y 4/1) coatings on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; gradual smooth boundary.

Cg—53 to 60 inches; dark gray (5Y 4/1), olive gray (5Y 4/2), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) silty clay loam; massive; firm; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 36 to 60 inches
Depth to carbonates: 50 inches or more
Thickness of the solum: 36 inches or more

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 or 1
Texture—silty clay or silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2 to 5
Chroma—1
Texture—silty clay or silty clay loam

Cg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—3 to 5
Chroma—1 to 6
Texture—silty clay loam, silty clay, or silt loam

3405A—Zook silty clay, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Zook and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that contain less clay in the subsoil than the Zook soil
- Soils that are lighter colored in the upper part of the subsoil than the Zook soil and have a thinner subsurface layer
- Soils that are subject to only occasional flooding

Dissimilar soils:
- The poorly drained Bryce soils on toeslopes of adjacent landforms
- The somewhat poorly drained Swygert soils on summits and footslopes of adjacent landforms

Properties and Qualities of the Zook Soil

Parent material: Alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity: About 8.8 inches to a depth of 60 inches
Content of organic matter in the surface layer: 5 to 7 percent
Shrink-swell potential: High
Apparent seasonal high water table is highest (depth, months): At the surface to 1 foot below the surface (January through May)
Ponding: 0.5 foot above the surface during wet periods
Flooding is most likely (frequency, months): Frequent (November through June)
Potential for frost action: High
Accelerated erosion: Negligible
Corrosivity: High for steel and moderate for concrete
Potential for surface runoff: Negligible
Hazard of water erosion: Slight
Hazard of wind erosion: Moderate

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Hydric

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Soil Series and Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In 1997, Ford County had about 300,307 acres of cropland (U.S Department of Commerce, 1997). About 5,038 acres was pasture, and 1,325 acres was woodland. The major row crops are corn and soybeans. Wheat is the major small grain crop grown. Alfalfa is the major forage crop.

The soils in Ford County have good potential for continued crop production, especially if the latest crop production technology is applied. This soil survey can be used as a guide for applying the latest crop production technologies.

The major soil management concerns affecting cropland in the county are water erosion, poor tilth, crusting, wetness, ponding, restricted permeability, and root-restrictive layers.

Erosion is a potential problem on approximately 20 percent of the cropland in the county. Erosion can be a problem on soils that have slopes of more than 2 percent, such as Dana, Elliott, and Rutland soils. It is also a hazard in less sloping areas if slopes are long and runoff water is concentrated.

Loss of the surface layer through sheet and rill erosion is damaging for several reasons. Soil productivity is reduced as the surface soil is removed and part of the subsoil is incorporated into the plow layer. The subsoil generally has fewer plant nutrients than the surface soil and has a lower content of organic matter and a higher content of clay. As the content of organic matter decreases and the content of clay increases in the plow layer, soil tilth deteriorates. Surface crusting and a reduced rate of water infiltration are the results. Under these conditions, preparing a good seedbed can be difficult. Erosion also results in the sedimentation of streams, rivers, road ditches, and lakes. This sedimentation negatively affects the quality of water for agricultural,

municipal, and recreational uses and for fish and wildlife. Removing the sediment generally is expensive. Controlling erosion helps to minimize this pollution and improves water quality.

Erosion-control measures include both cultural and structural practices. The most widely used practice in the county is conservation tillage. Methods of conservation tillage include chisel plowing, no-till farming, and ridge planting. These systems can leave from 20 to 90 percent of the surface covered with crop residue. No-till is most effective on moderately well drained and well drained soils, such as Dana and Proctor soils. Another cultural practice is a crop rotation that includes 1 or more years of close-growing grasses or legumes. If slopes are smooth and uniform, terraces (fig. 5) and contour farming are also effective in controlling erosion.

Structural practices are needed in drainageways where concentrated runoff flows overland. Establishing grassed waterways or installing erosion-control structures can help to control erosion.

Further information about erosion-control measures suitable for each kind of soil is provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Soil tilth is an important factor influencing the germination of seeds, the amount of runoff, and the rate of water infiltration. Soils that have good tilth are granular and porous and have a high content of organic matter.

Poor tilth is a problem on soils that have a surface layer of silty clay loam or silty clay. Bryce and Drummer soils are examples. If these soils are plowed when wet, the surface layer becomes cloddy. This cloddiness hinders the preparation of a good seedbed. Tilling in the fall, leaving the soil surface rough, and leaving moderate amounts of crop residue on the surface generally result in good tilth in the spring (fig. 6). A system of strip-till or ridge tillage can also improve tilth on these soils.

Crusting can also be a problem in areas of Camden

Figure 5.—Parallel tile outlet terraces are effective in controlling sheet and gully erosion.

Figure 6.—Strip-till corn planted in soybean residue in an area of Drummer and Raub soils. Leaving crop residue on the surface improves tilth in areas of these soils.

and Del Rey soils, which have a surface layer of silt loam or loam that has a low content of organic matter. Generally, the structure of these soils is weak, and a crust forms on the surface during periods of intense rainfall. This crust is hard when dry. It inhibits seedling emergence, reduces the infiltration rate, and increases runoff and erosion. Regular additions of crop residue, manure, and other organic material improve soil structure and minimize crusting.

Drainage systems have been installed in most areas of poorly drained and somewhat poorly drained soils used as cropland in the county. Therefore, these soils are adequately drained for the crops commonly grown. Measures that maintain the drainage system are needed. Poorly drained soils, such as Pella and Selma soils, have subsurface drainage. In addition, in some areas of poorly drained soils, such as Bryce, Rantoul, and Rowe soils, surface tile inlets or shallow surface ditches are needed to remove excess water. Some areas of somewhat poorly drained soils are wet long enough that in some years productivity is reduced, unless the soils are artificially drained. Somewhat poorly drained soils, such as Elliott, Raub, and Rutland soils, have subsurface drainage.

Restricted permeability can increase the hazard of erosion. As water movement slows within a soil, the runoff rate increases. The very slowly permeable Clarence soils are more susceptible to erosion than the moderately permeable Proctor soils. The effects of restricted permeability on the erosion hazard can be controlled by applying a cropping system that leaves crop residue on the surface after planting, incorporating green manure crops or crop residue into the soil, and using conservation cropping systems.

Restricted permeability can also limit the effectiveness of drainage systems. The slowly permeable Elliott soils require a narrower tile spacing than that in areas of the moderately permeable Raub soils for effectively lowering the seasonal high water table.

A root-restrictive layer in a soil limits the available water capacity. Varna, Swygert, and Clarence soils are moderately deep to layers that restrict the penetration of plant roots. Increasing the rate of water infiltration, reducing the runoff rate, or planting drought-tolerant species can minimize the effect of this limitation. Planting cover crops and using a system of conservation tillage that leaves crop residue on the surface after planting increase the rate of water infiltration and reduce the runoff rate. Planting drought-tolerant species, such as soybeans and winter wheat, is beneficial because these crops make the most efficient use of the limited amount of water.

Proper management is needed on hayland to prolong the life of desirable forage species, maintain or improve the quality and quantity of forage, and control erosion and reduce runoff. Hay may last as a vigorous crop for 4 to 5 years, depending on management and on the varieties seeded. Suitable hay plants include several legumes and cool-season grasses. Alfalfa is the legume most commonly grown for hay. It is typically used in mixtures with smooth bromegrass and orchardgrass. Alfalfa is best suited to moderately well drained soils, such as Dana and Parr soils. Red clover is also grown for hay. Measures that maintain or improve fertility are needed. The amount of lime and fertilizer to be added should be based on the results of soil tests, the needs of the plants, and the expected level of yields. Seed varieties should be selected in accordance with the soil properties and the drainage conditions of the tract of land.

Overgrazing reduces the vigor of pasture plants and reduces forage production. It also results in an increase in the extent of weeds and brush. Deferred grazing, rotation grazing, and proper stocking rates help to prevent overgrazing. Deferred grazing allows the plants in pastures that are not being used to build up reserves of carbohydrates. Rotating grazing among several pastures allows each area a rest period.

Many of the soils in the survey area have a high water table in spring. Deferring grazing during wet periods can minimize surface compaction. Pasture renovation also helps to prevent compaction. Frost heave can damage alfalfa and red clover in areas that have a seasonal high water table. Leaving a cover of

stubble 4 to 6 inches high during the winter and using mixtures of grasses and legumes help to prevent frost heave.

Cropland Management Considerations

The management concerns affecting the use of the soils in the survey area for crops and pasture are shown in table 6.

The main concerns in managing cropland are controlling water erosion, soil wetness, and ponding; minimizing crusting; improving poor tilth; and limiting the effects of excessive or restricted permeability.

Generally, a combination of several practices is needed to control *water erosion.* Conservation tillage, stripcropping, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

Wetness is a limitation in some areas of cropland, and *ponding* is a hazard. Drainage systems consist of subsurface tile drains, surface inlet tile, open drainage ditches, or a combination of these. Measures that maintain the drainage system are needed.

Practices that minimize *crusting* and improve *poor tilth* include incorporating green manure crops, manure, or crop residue into the soil and using a system of conservation tillage. Avoiding tillage when the soil is too wet can control surface cloddiness.

Restricted permeability can increase the hazard of erosion and also limits the effectiveness of drainage systems. Incorporating green manure crops, manure, or crop residue into the soil, applying a system of conservation tillage, and using conservation cropping systems help to control erosion. Narrower tile spacing can lower the seasonal high water table.

Excessive permeability can cause deep leaching of nutrients and pesticides. Selecting appropriate chemicals and using split application methods reduce the hazard of ground-water contamination.

A *root-restrictive layer* in a soil limits the amount of water available to plants. Planting cover crops and using a system of conservation tillage that leaves crop residue on the surface after planting increase the rate of water infiltration and reduce the runoff rate. Also, planting drought-tolerant crop species helps to maximize the efficient use of the limited available water supply.

Additional limitations and hazards are as follows:

Excess lime.—This limitation can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. In addition, crops may respond well to additions of phosphate fertilizer to soils that have a high content of lime.

Flooding.—This hazard cannot be easily overcome. Winter small grain crops can be damaged by flooding. Tilling and planting should be delayed in the spring until flooding is no longer a hazard. Dikes and diversions can reduce the extent of the crop damage caused by floodwater.

Low available water capacity.—This limitation can be minimized by reducing the evaporation and runoff rates and increasing the rate of water infiltration. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Explanation of Criteria

Crusting.—The organic matter content is 2.5 percent or less, and the clay content is greater than 20 percent in the surface layer.

Excess lime.—A calcium carbonate equivalent of 15 percent or more is within 16 inches of the surface.

Excessive permeability.—Permeability is 6 inches or more per hour within the soil profile.

Flooding.—The soil is subject to occasional or frequent flooding.

Low available water capacity.—The weighted average of the available water capacity between the surface and a depth of 40 inches is 0.1 inch or less.

Ponding.—A seasonal high water table is above the surface.

Poor tilth.—The clay content is 27 percent or more in the surface layer.

Restricted permeability.—Permeability is less than 0.2 inch per hour between the surface and a depth of 40 inches.

Root-restrictive layer.—Dense material is within a depth of 40 inches.

Water erosion.—The Kw factor of the surface layer multiplied by the slope is more than 0.8, and the slope is 3 percent or more.

Wetness.—The seasonal high water table is within a depth of 1.5 feet.

Pastureland Management Considerations

Growing legumes and cool-season grasses that are suited to the soils and climate in the survey area helps to maintain a productive stand of pasture. The main concerns affecting the management of pastureland in the county are listed in table 6. They include frost heave, water erosion, low pH, ponding, wetness, equipment limitation, a root-restrictive layer, excess

lime, limited available water capacity, flooding, and low fertility.

Frost heave is a limitation in areas of soils that have a moderate or high potential for frost action. It occurs when ice lenses or bands develop in the soil and drive an ice wedge between two layers of soil near the surface layer. The ice wedges heave the overlying soil layer upward, snapping the roots. Soils that have a low content of sand have small pores that hold water and enable ice lenses to form. Selecting adapted forage and hay varieties can reduce the effects of frost heave. Timely deferment of grazing, which maintains a surface cover that insulates the soil, also reduces the effects of frost heave.

Soils that have *low pH* have a pH value of 5.5 or less within 40 inches of the surface. Low pH inhibits the uptake of certain nutrients by the plants or accelerates the absorption of certain other elements to the level of toxic concentrations. Either of these conditions affects the health and vigor of plants. Applications of lime should be based on the results of soil tests. The goal is to achieve the optimum pH level for the uptake of the major nutrients by the specific grass, legume, or combination of grasses and legumes.

Pastureland soils that are susceptible to *water erosion* meet the following criteria: the value of the Kw factor multiplied by the percent slope is more than 0.8, and the slope is 3 percent or more. Water erosion reduces the productivity of pastureland. It also results in onsite and offsite sedimentation, causes water pollution by sedimentation, and increases the runoff of livestock manure and other added nutrients. Measures that are effective in controlling water erosion include establishing or renovating stands of legumes and grasses. Controlling erosion during seedbed preparation is a major concern. If the soil is tilled for the reseeding of pasture or hay crops, planting winter cover crops, establishing grassed waterways, farming on the contour, and using a system of conservation tillage that leaves crop residue on the surface can help to minimize erosion. Overgrazing or grazing when the soil is wet reduces the extent of plant cover and results in surface compaction and poor tilth, and thus it increases the susceptibility to erosion. Proper stocking rates, rotation grazing, and timely deferment of grazing, especially during wet periods, help to keep the pasture in good condition. The proper location of livestock watering facilities helps to prevent surface compaction or the formation of ruts by making it unnecessary for cattle to travel long distances up and down the steeper slopes.

Wetness is a limitation in some areas, and *ponding* is a hazard. Wetness occurs in areas where the seasonal high water table is within a depth of 1.5 feet. Ponding occurs when the seasonal high water table is above the surface. A drainage system that consists of subsurface tile drains, surface inlet tile, open drainage ditches, or a combination of these can lower the water table and remove excess water. Measures that maintain the drainage system are needed. Selecting species of grasses and legumes adapted to wet conditions can improve forage production. Restricted use during wet periods helps to keep the pasture in good condition.

Equipment limitation is a concern in areas where slopes are more than 10 percent. It can cause rapid wear of equipment. It can also present problems with fertilization, harvest, pasture renovation, and seedbed preparation. This limitation cannot be easily overcome.

Frequent *flooding* can damage forage stands and delay harvesting in some years. Dikes and diversions help to control the extent of damage caused by floodwater. Selecting species of grasses and legumes adapted to wet conditions can improve forage production. Restricted use during wet periods helps to keep the pasture in good condition.

Limited available water capacity means that the weighted average of the available water capacity between the surface and a depth of 40 inches is 0.1 inch or less. Available water capacity refers to the capacity of soils to hold water available for use by most plants. The quality and quantity of the pasture may be reduced if the pasture cannot support the desired number of livestock because the available water is inadequate for the maintenance of a healthy community of desired pasture species. A poor quality pasture may increase the hazard of water erosion and increase the runoff of pollutants. Planting drought-resistant species of grasses and legumes helps to establish a cover of vegetation. The plants should not be clipped or grazed until they are sufficiently established.

Soils that have a *root-restrictive layer* have a dense layer of till within a depth of 40 inches. This dense layer inhibits root penetration and restricts the amount of water that is available to plants. Deep-rooted perennial legumes and grasses make the most efficient use of the limited amount of available moisture. Selecting drought-tolerant species of legumes and grasses can improve forage production.

Excess lime occurs in soils that have a calcium carbonate equivalent of 15 percent or more within a depth of 16 inches. The high pH level associated with this condition can inhibit the uptake of certain nutrients and micronutrients by the plants, or it can accelerate the absorption of certain other elements to the level of toxic concentrations. Either of these conditions affects

the health and vigor of the plants. Applications of sulfate and phosphate compounds or additions of certain forms of nitrogen fertilizer can lower the pH. Selecting species of grasses and legumes that are tolerant of a high pH level can improve forage production.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents (Fehrenbacher and others, 1978). Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 7 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Pasture Yield Estimates

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in the yields table.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The capability classification of map units in this survey area is given in the section “Soil Series and Detailed Soil Map Units” and in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

About 282,500 acres, or nearly 90 percent of the survey area, meets the requirements for prime farmland. Areas of this land are throughout the county.

The map units in the survey area that are considered prime farmland are listed in table 8. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 5. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading “Soil Series and Detailed Soil Map Units.”

Forestland

The forests of today are changing because of the introduction of species from around the world. The planting of trees for windbreaks, erosion control, and ornamental value has impacted forestland. The introduced species and the native pioneer species are changing the composition of forestland.

In 1997, Ford County had about 1,325 acres of forestland (U.S. Department of Commerce, 1997). The forests in the county are esthetically pleasing, but they also serve to protect and enhance watershed quality, recreation, and wildlife habitat. The small amount of forestland that still exists in the county could be greatly improved if proper management measures were applied. Assistance in establishing, improving, or

managing forestland is available from foresters or natural resource specialists with various local, State, and Federal agencies, including the Illinois Department of Natural Resources, the Forest Service, the Natural Resources Conservation Service, and the local Soil and Water Conservation District.

Table 9 provides information regarding the productivity of the soils in the county for forestland. The *potential productivity* for merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. Only those soils suitable for wood crops are listed.

The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected based on growth rate, quality, value, and marketability. More detailed information is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow (fig. 7); help to keep snow on fields; and provide food and cover for wildlife. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 10 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 10 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in table 11 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 11, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these.

The information in table 11 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 15 and interpretations for dwellings without basements and for local roads and streets in table 14.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp

Figure 7.—Farmstead windbreaks protect homes and livestock from wind and snow. They also enhance the appearance of the farmstead and provide habitat for wildlife.

areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

The topography of Ford County, which is primarily the result of glacial action, provides habitats that support a variety of wildlife species. The area was originally covered by native prairie grasses and also contained wet meadows, marshes, and areas of open water.

As the county was settled, the conversion of land to agricultural uses altered these natural communities and affected the wildlife populations associated with them. Ford County is now a mosaic of cropland, farmsteads, urban areas, roads, wetlands, and waterways and supports wildlife species that have adapted to the human-altered landscapes. These species include whitetail deer, mallards, pheasants, squirrels, crows, cardinals, house sparrows, mourning doves, raccoon, fox, and coyote.

In general, most of the land in the county is not managed primarily for wildlife. Good land management practices, however, can improve the value of an area for wildlife. For example, farm practices that leave crop residue on the fields during the fall and winter not only help to control erosion but also provide winter cover and food for some wildlife species. Leaving grassed waterways, road ditches, fencelines, set-aside fields, and vacant properties unmowed until early August provides much-needed habitat for ground-nesting wildlife species, such as rabbits, pheasants, and many kinds of songbirds (fig. 8).

Many temporarily and seasonally flooded wetlands have been impacted by land use practices. Development and cultivation should be avoided in these wetland areas. Buffer strips surrounding wetland areas provide food and nesting cover for many wildlife species and help to prevent the wetlands from filling in with eroded sediment. Wetlands, streambanks, and woodlots should be fenced so that livestock are excluded. Fencing protects and maintains the native plant communities that support wildlife species, helps to control erosion, and improves water quality in streams and rivers.

When attempts are made to restore or manage an area for wildlife, it is important to understand the kinds of soils on the site. For example, soils that have a seasonal high water table will most likely support vegetation that is tolerant of wet conditions and thus attract wetland wildlife species. If the soil series is characterized by wetness or hydric properties but the area does not appear to be susceptible to wetness, there may be an existing drainage ditch or a system of subsurface tile drains. Areas that have been drained can provide opportunities for the restoration of wetland habitat as long as negative impacts on neighboring properties are avoided.

Nonhydric soils in the uplands support communities once dominated by prairie grass and oak savanna habitats. These habitats can also be restored through management that promotes or reestablishes the native plant species while controlling or eliminating competing exotic vegetation.

Assistance with wildlife habitat projects can be obtained from various local, State, and Federal agencies, including the Illinois Department of Conservation, the U.S. Fish and Wildlife Service, the Natural Resources Conservation Service, and the local Soil and Water Conservation District.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 12, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties

Figure 8.—Leaving unmowed buffer strips along drainage ditches provides good habitat for openland wildlife.

and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, bromegrass, timothy, orchardgrass, clover, alfalfa, trefoil, reed canarygrass, and crownvetch.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, indiangrass, goldenrod, lambsquarter, dandelions, ragweed, smartweed, and nightshade.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, hickory, poplar, birch, maple, green ash, willow, and American elm. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are hawthorn, honeysuckle, American plum, redosier dogwood, chokecherry, hazelnut, serviceberry, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, rushes, sedges, reeds, wild rice, saltgrass, cordgrass, and cattail.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are muskrat marshes, waterfowl feeding areas, wildlife watering developments, beaver ponds, and other ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, owls, squirrels, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, frogs, snakes, turtles, muskrat, and beaver.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 1998) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1998).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Table 13 lists the hydric characteristics of the soils in Ford County. It identifies hydric soils and also nonhydric soils that may have hydric inclusions. This list can help in planning land uses on a specific site; however, onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils (National Research Council, 1995; Hurt and others, 1998).

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data provided in the tables under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 14 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, or other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without

basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 15 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid

permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, rock fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They

are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to

seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

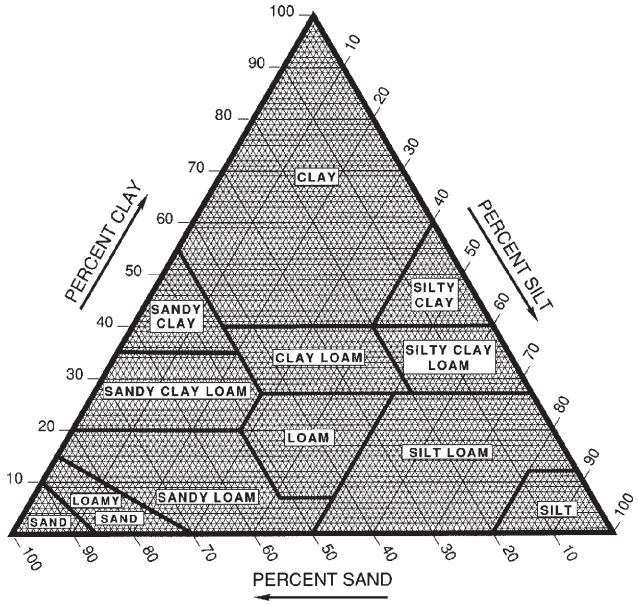

Figure 9.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 18 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 9). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained

and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

Table 19 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In table 19, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In table 19, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 19, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is

considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 19, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 19 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 20 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Water Features

Table 21 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 21 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

The table also shows the kind of water table. An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 21 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than

once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 22 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

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Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal till. Compact till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Beach deposits. Material, such as sand and gravel, that is generally laid down parallel to an active or relict shoreline of a postglacial or glacial lake.

Beach ridge. A low, essentially continuous mound of beach or beach-and-dune material heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves or the reach of ordinary tides, and occurring singly or as one of a series of approximately parallel deposits. The ridges are roughly parallel to the shoreline and represent successive positions of an advancing shoreline.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bog. Waterlogged, spongy ground, consisting primarily of mosses, containing acidic, decaying vegetation, such as sphagnum, sedges, and heaths, that develops into peat.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clayey soil. Silty clay, sandy clay, or clay. Generally, a soil with a clay content averaging more than 35 percent.

Closed depression. A low area completely surrounded by higher ground and having no natural outlet.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to

improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. Relatively small, linear depressions that, at some time, move concentrated water and either do not have a defined channel or have only a small defined channel.

Drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

End moraine. A ridgelike accumulation that is being or was produced at the outer margin of an actively flowing glacier at any given time.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large

amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphology. The science that treats the general configuration of the earth's surface; specifically, the study of the classification, description, nature, origin, and development of landforms and their relationships to underlying structures, and the history of geologic changes as recorded by these surface features. The term is especially applied to the genetic interpretation of landforms.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground moraine. An extensive, fairly even layer of till having an uneven or undulating surface; a deposit of rock and mineral debris dragged along, in, on, or beneath a glacier and emplaced by processes including basal lodgment and release from the downwasting stagnant ice by ablation.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Herbaceous peat. An accumulation of organic material, decomposed to some degree, that is predominantly the remains of sedges, reeds, cattails, and other herbaceous plants.

High-chroma zones. Zones having chroma of 3 or more. Typical colors in areas of iron concentrations.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue

from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron accumulations. High-chroma zones having a

high content of iron and manganese oxide because of chemical oxidation and accumulation but having a clay content similar to that of the adjacent matrix. A type of redoximorphic feature.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Leached soil. A soil from which most of the soluble constituents have been removed from the entire profile or have been removed from one part of the profile and have accumulated in another part.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Low-chroma zones. Zones having chroma of 2 or less. Typical colors in areas of iron depletions.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

MAP. An abbreviation for mean annual precipitation, expressed in inches.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

MLRA (Major Land Resource Area). A geographic area characterized by a particular pattern of land uses, elevation and topography, soils, climate, water resources, and potential natural vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and

chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending

through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Seasonal high water table. A zone of saturation at the highest average depth during the wettest season. It is at least 6 inches thick and persists in the soil for more than a few weeks.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil quality. The fitness of a specific kind of soil to function within its surroundings, support plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swale. A slight depression in the midst of generally level land. A shallow depression in an undulating ground moraine caused by uneven glacial deposition.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick drift that generally marks the termination of important glacial advances. It commonly is a massive, arcuate ridge or complex of ridges underlain by till and other types of drift.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till. Unsorted, nonstratified drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Till plain. An extensive area of nearly level to undulating soils underlain by till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1971-2000 at Gibson City, Illinois)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	31.7	15.9	23.8	59	-16	0	1.60	0.64	2.49	4	7.2
February---	37.2	20.3	28.7	66	-10	2	1.59	.48	2.61	3	5.6
March------	48.4	29.1	38.8	80	7	32	2.99	1.44	4.36	6	2.2
April------	60.7	38.3	49.5	85	17	111	3.31	1.95	4.54	7	.7
May--------	72.8	50.1	61.4	91	32	362	4.07	2.37	5.62	7	.0
June-------	82.2	59.8	71.0	97	43	632	4.04	1.79	6.25	6	.0
July-------	84.7	63.0	73.9	98	49	742	3.74	1.78	5.64	6	.0
August-----	83.2	60.2	71.7	97	44	672	3.91	2.01	5.53	5	.0
September--	77.4	51.5	64.4	94	32	438	2.83	1.35	4.04	4	.0
October----	64.7	40.1	52.4	85	22	154	2.66	1.34	3.69	5	.1
November---	48.9	30.9	39.9	73	11	28	3.01	1.39	4.52	6	1.6
December---	35.5	19.8	27.7	64	-10	5	2.54	1.15	3.90	5	5.7
Yearly:											
Average---	60.6	39.9	50.3	---	---	---	---	---	---	---	---
Extreme---	103	-25	---	99	-19	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,177	36.29	30.28	41.69	64	23.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Gibson City, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 18	Apr. 25	May 4
2 years in 10 later than--	Apr. 12	Apr. 20	Apr. 29
5 years in 10 later than--	Apr. 2	Apr. 10	Apr. 19
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 18	Oct. 1	Sept. 23
2 years in 10 earlier than--	Oct. 24	Oct. 7	Sept. 27
5 years in 10 earlier than--	Nov. 3	Oct. 17	Oct. 6

Table 3.--Growing Season

(Recorded in the period 1971-2000 at Gibson City, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	192	166	151
8 years in 10	199	174	158
5 years in 10	214	190	170
2 years in 10	229	205	182
1 year in 10	237	213	189

Table 4.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Ashkum	Fine, mixed, superactive, mesic Typic Endoaquolls
Blount	Fine, illitic, mesic Aeric Epiaqualfs
Brenton	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Bryce	Fine, mixed, superactive, mesic Vertic Endoaquolls
Camden	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Chatsworth	Fine, illitic, mesic Oxyaquic Eutrudepts
Chenoa	Fine, illitic, mesic Aquic Argiudolls
*Clarence	Fine, illitic, mesic Aquic Argiudolls
*Dana	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Del Rey	Fine, illitic, mesic Aeric Epiaqualfs
Drummer	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
*Elliott	Fine, illitic, mesic Aquic Argiudolls
*Graymont	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Harpster	Fine-silty, mixed, superactive, mesic Typic Calciaquolls
Houghton	Euic, mesic Typic Haplosaprists
La Hogue	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Martinsville	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Martinton	Fine, illitic, mesic Aquic Argiudolls
Milford	Fine, mixed, superactive, mesic Typic Endoaquolls
Mokena	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Onarga	Coarse-loamy, mixed, superactive, mesic Typic Argiudolls
Orthents, clayey	Fine, mixed, active, nonacid, mesic Aquic Udorthents
Orthents, loamy	Fine-loamy, mixed, active, nonacid, mesic Oxyaquic Udorthents
Ozaukee	Fine, illitic, mesic Oxyaquic Hapludalfs
*Parr	Fine-loamy, mixed, active, mesic Oxyaquic Argiudolls
Pella	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Penfield	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Peotone	Fine, smectitic, mesic Cumulic Vertic Endoaquolls
Proctor	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Rantoul	Fine, smectitic, mesic Cumulic Vertic Endoaquolls
Raub	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Ridgeville	Coarse-loamy, mixed, superactive, mesic Aquic Argiudolls
Rowe	Fine, mixed, superactive, mesic Vertic Argiaquolls
Rutland	Fine, smectitic, mesic Aquic Argiudolls
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Selma	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
*Swygert	Fine, mixed, active, mesic Aquic Argiudolls
Symerton	Fine-loamy, mixed, superactive, mesic Oxyaquic Argiudolls
*Varna	Fine, illitic, mesic Oxyaquic Argiudolls
Zook	Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
23A	Blount silt loam, 0 to 2 percent slopes	644	0.2
23B2	Blount silt loam, 2 to 4 percent slopes, eroded	151	*
56B	Dana silt loam, 2 to 5 percent slopes	3,372	1.1
56B2	Dana silt loam, 2 to 5 percent slopes, eroded	182	*
67A	Harpster silty clay loam, 0 to 2 percent slopes	331	0.1
69A	Milford silty clay loam, 0 to 2 percent slopes	22,546	7.2
91A	Swygert silty clay loam, 0 to 2 percent slopes	15,639	5.0
91B2	Swygert silty clay loam, 2 to 4 percent slopes, eroded	9,060	2.9
102A	La Hogue loam, 0 to 2 percent slopes	606	0.2
125A	Selma loam, 0 to 2 percent slopes	1,996	0.6
134A	Camden silt loam, 0 to 2 percent slopes	719	0.2
146A	Elliott silt loam, 0 to 2 percent slopes	28,714	9.2
146B2	Elliott silty clay loam, 2 to 4 percent slopes, eroded	14,735	4.7
147A	Clarence silty clay loam, 0 to 2 percent slopes	4,841	1.6
147B2	Clarence silty clay loam, 2 to 4 percent slopes, eroded	3,888	1.2
148B	Proctor silt loam, 2 to 5 percent slopes	2,610	0.8
148B2	Proctor silt loam, 2 to 5 percent slopes, eroded	21	*
149A	Brenton silt loam, 0 to 2 percent slopes	8,566	2.7
150B	Onarga fine sandy loam, 2 to 5 percent slopes	161	*
151A	Ridgeville fine sandy loam, 0 to 2 percent slopes	296	*
152A	Drummer silty clay loam, 0 to 2 percent slopes	32,134	10.3
153A	Pella silty clay loam, 0 to 2 percent slopes	23,038	7.4
189A	Martinton silt loam, 0 to 2 percent slopes	3,157	1.0
192A	Del Rey silt loam, 0 to 2 percent slopes	971	0.3
221C2	Parr silt loam, 5 to 10 percent slopes, eroded	163	*
221C3	Parr clay loam, 5 to 10 percent slopes, severely eroded	461	0.1
223B2	Varna silt loam, 2 to 4 percent slopes, eroded	668	0.2
223C2	Varna silt loam, 4 to 6 percent slopes, eroded	547	0.2
230A	Rowe silty clay loam, 0 to 2 percent slopes	12,591	4.0
232A	Ashkum silty clay loam, 0 to 2 percent slopes	47,764	15.3
235A	Bryce silty clay, 0 to 2 percent slopes	46,018	14.7
238A	Rantoul silty clay, 0 to 2 percent slopes	1,253	0.4
241C3	Chatsworth silty clay, 4 to 6 percent slopes, severely eroded	2,585	0.8
241D3	Chatsworth silty clay, 6 to 12 percent slopes, severely eroded	358	0.1
294B	Symerton silt loam, 2 to 5 percent slopes	452	0.1
295A	Mokena silt loam, 0 to 2 percent slopes	2	*
330A	Peotone silty clay loam, 0 to 2 percent slopes	2,424	0.8
375A	Rutland silty clay loam, 0 to 2 percent slopes	2,044	0.7
375B	Rutland silty clay loam, 2 to 5 percent slopes	7,126	2.3
481A	Raub silt loam, 0 to 2 percent slopes	3,145	1.0
530B	Ozaukee silt loam, 2 to 4 percent slopes	335	0.1
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	72	*
530E2	Ozaukee silt loam, 12 to 20 percent slopes, eroded	22	*
541B2	Graymont silt loam, 2 to 5 percent slopes, eroded	120	*
570C2	Martinsville loam, 5 to 10 percent slopes, eroded	19	*
614A	Chenoa silty clay loam, 0 to 2 percent slopes	196	*
687B	Penfield loam, 2 to 5 percent slopes	641	0.2
802B	Orthents, loamy, undulating	251	*
805B	Orthents, clayey, undulating	118	*
865	Pits, gravel	179	*
1103A	Houghton muck, undrained, 0 to 2 percent slopes	367	0.1
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	2,778	0.9
3405A	Zook silty clay, 0 to 2 percent slopes, frequently flooded	813	0.3
W	Water	430	0.1
	Total	312,320	100.0

* Less than 0.1 percent.

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland

(See text for a description of the limitations and hazards listed in this table. Miscellaneous areas and map units that are generally not available for production of crops or pasture are not listed. Absence of an entry indicates that the map unit is generally not suited to use as cropland or pastureland)

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
23A:		
Blount	Wetness, root-restrictive layer, crusting, restricted permeability	Wetness, root-restrictive layer, low pH, frost heave
23B2:		
Blount	Wetness, root-restrictive layer, crusting, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, frost heave
56B:		
Dana	Water erosion	Low pH, water erosion, frost heave
56B2:		
Dana	Water erosion	Low pH, water erosion, frost heave
67A:		
Harpster	Ponding, poor tilth, excess lime	Ponding, excess lime, frost heave
69A:		
Milford	Ponding, poor tilth	Ponding, frost heave
91A:		
Swygert	Wetness, root-restrictive layer, poor tilth, restricted permeability	Wetness, root-restrictive layer, frost heave
91B2:		
Swygert	Wetness, root-restrictive layer, poor tilth, water erosion, restricted permeability	Wetness, root-restrictive layer, water erosion, frost heave
102A:		
La Hogue	Wetness	Wetness, low pH, frost heave
125A:		
Selma	Ponding	Ponding, frost heave
134A:		
Camden	Crusting	Low pH, frost heave
146A:		
Elliott	Wetness, root-restrictive layer	Wetness, root-restrictive layer, frost heave
146B2:		
Elliott	Wetness, root-restrictive layer, poor tilth, water erosion, restricted permeability	Wetness, root-restrictive layer, water erosion, frost heave

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland--Continued

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
147A: Clarence	Wetness, root-restrictive layer, poor tilth, limited available water capacity, restricted permeability	Wetness, root-restrictive layer, limited available water capacity, frost heave
147B2: Clarence	Wetness, root-restrictive layer, poor tilth, limited available water capacity, water erosion, restricted permeability	Wetness, root-restrictive layer, limited available water capacity, water erosion, frost heave
148B: Proctor	Water erosion	Low pH, water erosion, frost heave
148B2: Proctor	Water erosion	Low pH, water erosion, frost heave
149A: Brenton	Wetness	Wetness, frost heave
150B: Onarga	Water erosion, excessive permeability	Low pH, water erosion, frost heave
151A: Ridgeville	Wetness, excessive permeability	Wetness, frost heave
152A: Drummer	Ponding, poor tilth	Ponding, frost heave
153A: Pella	Ponding, poor tilth	Ponding, frost heave
189A: Martinton	Wetness	Wetness, frost heave
192A: Del Rey	Wetness, crusting, restricted permeability	Wetness, low pH, frost heave
221C2: Parr	Crusting, water erosion	Water erosion, frost heave
221C3: Parr	Poor tilth, crusting, water erosion	Water erosion, frost heave
223B2: Varna	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
223C2: Varna	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland--Continued

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
230A: Rowe	Ponding, poor tilth, restricted permeability	Ponding, low pH, frost heave
232A: Ashkum	Ponding, poor tilth	Ponding, frost heave
235A: Bryce	Ponding, poor tilth, restricted permeability	Ponding, frost heave
238A: Rantoul	Ponding, poor tilth, restricted permeability	Ponding, frost heave
241C3: Chatsworth	---	Root-restrictive layer, water erosion, limited available water capacity, low fertility, excess lime, frost heave
241D3. Chatsworth		
294B: Symerton	Water erosion, restricted permeability	Water erosion, frost heave
295A: Mokena	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, frost heave
330A: Peotone	Ponding, poor tilth	Ponding, frost heave
375A: Rutland	Wetness, poor tilth	Wetness, low pH, frost heave
375B: Rutland	Wetness, poor tilth, water erosion, restricted permeability	Wetness, low pH, water erosion, frost heave
481A: Raub	Wetness	Wetness, frost heave
530B: Ozaukee	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
530D2: Ozaukee	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, equipment limitation, frost heave
530E2: Ozaukee	Root-restrictive layer, crusting, water erosion, restricted permeability	Equipment limitation, root-restrictive layer, water erosion, frost heave

Table 6.--Limitations and Hazards Affecting Cropland and Pastureland--Continued

Map symbol and soil name	Limitations and hazards affecting cropland	Limitations and hazards affecting pastureland
541B2:		
Graymont	Water erosion, restricted permeability	Water erosion, frost heave
570C2:		
Martinsville	Water erosion	Low pH, water erosion, frost heave
614A:		
Chenoa	Wetness, poor tilth, restricted permeability	Wetness, frost heave
687B:		
Penfield	Water erosion	Low pH, water erosion, frost heave
802B:		
Orthents, loamy	Crusting, water erosion	Water erosion, frost heave
805B:		
Orthents, clayey	Poor tilth, crusting, water erosion, limited available water capacity, restricted permeability	Water erosion, limited available water capacity, frost heave
1103A.		
Houghton		
3107A:		
Sawmill	Flooding, ponding, poor tilth	Flooding, ponding, frost heave
3405A:		
Zook	Flooding, ponding, poor tilth, restricted permeability	Flooding, ponding, frost heave

Table 7.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
23A:							
Blount	2w	106	35	48	64	4.3	7.2
23B2:							
Blount	2e	102	34	46	61	4.1	6.9
56B:							
Dana	2e	142	45	59	84	5.4	9.1
56B2:							
Dana	2e	137	43	58	82	5.3	8.8
67A:							
Harpster	2w	136	44	52	74	5.0	8.3
69A:							
Milford	2w	131	48	56	81	5.2	8.7
91A:							
Swygert	2w	114	39	51	73	4.5	7.5
91B2:							
Swygert	2e	107	37	48	69	4.2	7.1
102A:							
La Hogue	1	129	43	56	80	5.2	8.7
125A:							
Selma	2w	136	44	53	76	5.0	8.3
134A:							
Camden	1	125	39	55	72	5.0	8.3
146A:							
Elliott	2w	128	45	55	79	5.1	8.5
146B2:							
Elliott	2e	123	43	53	76	4.9	8.2
147A:							
Clarence	3w	100	35	47	66	4.1	6.8
147B2:							
Clarence	3e	96	34	45	63	3.9	6.5
148B:							
Proctor	2e	143	44	58	87	5.4	9.1
148B2:							
Proctor	2e	138	42	57	84	5.3	8.8
149A:							
Brenton	1	160	47	62	91	5.9	9.8
150B:							
Onarga	2e	109	36	48	73	4.2	6.9

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
151A:							
Ridgeville	2s	115	40	53	75	4.6	7.7
152A:							
Drummer	2w	154	51	61	83	5.5	9.2
153A:							
Pella	2w	140	48	56	78	5.2	8.7
189A:							
Martinton	2w	135	49	57	84	5.3	8.8
192A:							
Del Rey	2w	115	37	49	69	4.5	7.5
221C2:							
Parr	3e	121	41	54	73	5.0	8.3
221C3:							
Parr	4e	112	38	50	68	4.6	7.7
223B2:							
Varna	2e	118	39	51	72	4.6	7.7
223C2:							
Varna	3e	117	39	50	71	4.6	7.6
230A:							
Rowe	3w	108	40	45	63	4.0	6.7
232A:							
Ashkum	2w	130	47	54	79	5.0	8.3
235A:							
Bryce	2w	120	43	48	70	4.4	7.3
238A:							
Rantoul	3w	99	35	36	50	3.2	5.3
241C3:							
Chatsworth	6e	---	---	---	---	1.6	2.7
241D3:							
Chatsworth	7e	---	---	---	---	1.6	2.6
294B:							
Symerton	2e	135	44	58	82	5.3	8.9
295A:							
Mokena	2w	126	41	55	77	4.7	7.8
330A:							
Peotone	2w	123	42	43	58	4.2	7.0
375A:							
Rutland	2w	132	45	59	84	5.3	8.8
375B:							
Rutland	2e	131	45	58	83	5.2	8.7

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
481A:							
Raub	1	155	51	63	92	6.1	10.2
530B:							
Ozaukee	2e	105	32	47	75	4.3	7.1
530D2:							
Ozaukee	3e	99	30	44	71	4.0	6.7
530E2:							
Ozaukee	4e	91	28	40	65	3.7	6.2
541B2:							
Graymont	2e	131	39	55	77	5.2	8.6
570C2:							
Martinsville	3e	114	35	48	62	4.5	7.5
614A:							
Chenoa	2w	132	44	56	81	5.3	8.8
687B:							
Penfield	2e	137	42	56	87	5.2	8.7
802B:							
Orthents, loamy	2e	85	27	30	50	3.7	6.2
805B:							
Orthents, clayey	3e	77	24	26	46	3.3	5.6
865.							
Pits, gravel							
1103A:							
Houghton	5w	---	---	---	---	---	---
3107A:							
Sawmill	3w	132	42	49	68	5.0	8.3
3405A:							
Zook	3w	83	32	38	58	3.2	5.2
W.							
Water							

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 8.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
23A	Blount silt loam, 0 to 2 percent slopes (where drained)
23B2	Blount silt loam, 2 to 4 percent slopes, eroded
56B	Dana silt loam, 2 to 5 percent slopes
56B2	Dana silt loam, 2 to 5 percent slopes, eroded
67A	Harpster silty clay loam, 0 to 2 percent slopes (where drained)
69A	Milford silty clay loam, 0 to 2 percent slopes (where drained)
91A	Swygert silty clay loam, 0 to 2 percent slopes
91B2	Swygert silty clay loam, 2 to 4 percent slopes, eroded
102A	La Hogue loam, 0 to 2 percent slopes
125A	Selma loam, 0 to 2 percent slopes (where drained)
134A	Camden silt loam, 0 to 2 percent slopes
146A	Elliott silt loam, 0 to 2 percent slopes
146B2	Elliott silty clay loam, 2 to 4 percent slopes, eroded
148B	Proctor silt loam, 2 to 5 percent slopes
148B2	Proctor silt loam, 2 to 5 percent slopes, eroded
149A	Brenton silt loam, 0 to 2 percent slopes
150B	Onarga fine sandy loam, 2 to 5 percent slopes
151A	Ridgeville fine sandy loam, 0 to 2 percent slopes
152A	Drummer silty clay loam, 0 to 2 percent slopes (where drained)
153A	Pella silty clay loam, 0 to 2 percent slopes (where drained)
189A	Martinton silt loam, 0 to 2 percent slopes
192A	Del Rey silt loam, 0 to 2 percent slopes (where drained)
221C2	Parr silt loam, 5 to 10 percent slopes, eroded
223B2	Varna silt loam, 2 to 4 percent slopes, eroded
223C2	Varna silt loam, 4 to 6 percent slopes, eroded
232A	Ashkum silty clay loam, 0 to 2 percent slopes (where drained)
235A	Bryce silty clay, 0 to 2 percent slopes (where drained)
294B	Symerton silt loam, 2 to 5 percent slopes
295A	Mokena silt loam, 0 to 2 percent slopes
330A	Peotone silty clay loam, 0 to 2 percent slopes (where drained)
375A	Rutland silty clay loam, 0 to 2 percent slopes
375B	Rutland silty clay loam, 2 to 5 percent slopes
481A	Raub silt loam, 0 to 2 percent slopes
530B	Ozaukee silt loam, 2 to 4 percent slopes
541B2	Graymont silt loam, 2 to 5 percent slopes, eroded
614A	Chenoa silty clay loam, 0 to 2 percent slopes
687B	Penfield loam, 2 to 5 percent slopes
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3405A	Zook silty clay, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)

Table 9.--Forestland Productivity

(Only the soils suitable for commercial production of trees are listed)

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
23A:				
Blount	Northern red oak	57	43	Black oak, bur oak,
	Sugar maple	54	29	chinkapin oak,
	White ash	57	43	common hackberry,
	White oak	57	43	eastern redcedar,
				green ash
23B2:				
Blount	Northern red oak	57	43	Black oak, bur oak,
	White oak	57	43	chinkapin oak,
	Sugar maple	54	29	common hackberry,
	White ash	57	43	eastern redcedar,
				green ash
134A:				
Camden	White oak	85	72	Black walnut,
	Green ash	76	72	eastern
	Northern red oak	85	72	cottonwood,
	Sweetgum	80	86	eastern white
	Tuliptree	95	100	pine, green ash,
				northern red oak,
				pecan, pin oak,
				tuliptree, white
				oak
192A:				
Del Rey	Northern red oak	56	43	Black oak, bur oak,
	Red maple	56	29	chinkapin oak,
	White ash	56	43	common hackberry,
	White oak	56	43	eastern redcedar,
	American basswood	56	43	green ash
530B:				
Ozaukee	Northern red oak	66	57	Black oak, bur oak,
	American basswood	---	---	chinkapin oak,
	Sugar maple	---	---	common hackberry,
	White ash	---	---	eastern redcedar,
				green ash
530D2:				
Ozaukee	Northern red oak	66	57	Black oak, bur oak,
	American basswood	---	---	chinkapin oak,
	Sugar maple	---	---	common hackberry,
	White ash	---	---	eastern redcedar,
				green ash
530E2:				
Ozaukee	Northern red oak	66	57	Black oak, bur oak,
	Sugar maple	---	---	chinkapin oak,
	White ash	---	---	common hackberry,
	American basswood	---	---	eastern redcedar,
				green ash

Table 9.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
570C2:				
Martinsville	White oak	80	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, tuliptree, white oak
	Sweetgum	76	72	
	Tuliptree	98	100	
1103A:				
Houghton	Silver maple	82	29	Common persimmon, eastern cottonwood, green ash, pin oak, swamp white oak, sweetgum
	Arborvitae	37	57	
	Green ash	---	---	
	Quaking aspen	60	57	
	Red maple	56	29	
	White ash	56	43	
3107A:				
Sawmill	Pin oak	90	72	Common hackberry, eastern cottonwood, green ash, pin oak, river birch, swamp white oak, sweetgum
	American sycamore	---	---	
	Eastern cottonwood	---	---	
	Sweetgum	---	---	

Table 10.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
23A:					
Blount	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
23B2:					
Blount	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
56B:					
Dana	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
56B2:					
Dana	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
67A:					
Harpster	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---
69A:					
Milford	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
91A:					
Swygert	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
91B2:					
Swygert	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
102A:					
La Hogue	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
125A:					
Selma	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
134A:					
Camden	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
146A:					
Elliott	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
146B2:					
Elliott	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
147A:					
Clarence	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
147B2:					
Clarence	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
148B:					
Proctor	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
148B2:					
Proctor	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
149A:					
Brenton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
150B:					
Onarga	American hazelnut, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf viburnum	American plum, American witchhazel, Arnold hawthorn, blackhaw, common chokecherry, common serviceberry, prairie crabapple	Douglas fir, arborvitae, black walnut, blackgum, blue spruce, bur oak, eastern redcedar, green ash, pecan	Norway spruce, common hackberry, pin oak, red pine, tuliptree	Carolina poplar, eastern white pine
151A:					
Ridgeville	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
152A:					
Drummer	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
153A:					
Pella	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---
189A:					
Martinton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
192A:					
Del Rey	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce-------	Carolina poplar

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
221C2:					
Parr	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
221C3:					
Parr	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
223B2:					
Varna	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
223C2:					
Varna	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
230A:					
Rowe	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
232A:					
Ashkum	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
235A: Bryce	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
238A: Rantoul	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
241C3: Chatsworth	Coralberry, mapleleaf viburnum, redosier dogwood, roughleaf dogwood	American cranberrybush, Ohio buckeye, bitternut hickory, bur oak, chinkapin oak, cockspur hawthorn, common chokecherry, eastern redcedar	Austrian pine, common hackberry, green ash, thornless honeylocust	Carolina poplar-----	---
241D3: Chatsworth	Coralberry, mapleleaf viburnum, redosier dogwood, roughleaf dogwood	American cranberrybush, Ohio buckeye, bitternut hickory, bur oak, chinkapin oak, cockspur hawthorn, common chokecherry, eastern redcedar	Austrian pine, common hackberry, green ash, thornless honeylocust	Carolina poplar-----	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
294B:					
Symerton	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
295A:					
Mokena	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
330A:					
Peotone	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
375A: Rutland	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
375B: Rutland	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
481A: Raub	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
530B:					
Ozaukee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
530D2:					
Ozaukee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
530E2:					
Ozaukee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
541B2:					
Graymont	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
570C2:					
Martinsville	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
614A:					
Chenoa	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, common persimmon, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
687B:					
Penfield	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
802B:					
Orthents, loamy	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
805B:					
Orthents, clayey	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
865.					
Pits, gravel					
1103A:					
Houghton	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Common serviceberry, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, common persimmon	Green ash, pin oak, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
3107A: Sawmill	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak
3405A: Zook	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak, sweetgum	Carolina poplar, eastern cottonwood, pin oak

Table 11.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
23A:					
Blount	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
23B2:					
Blount	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
56B:					
Dana	Moderate: wetness	Moderate: wetness	Moderate: slope wetness	Slight	Slight
56B2:					
Dana	Moderate: wetness	Moderate: wetness	Moderate: slope wetness	Slight	Slight
67A:					
Harpster	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
69A:					
Milford	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
91A:					
Swygert	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
91B2:					
Swygert	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
102A:					
La Hogue	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
125A:					
Selma	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
134A:					
Camden	Slight	Slight	Slight	Slight	Slight
146A:					
Elliott	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
146B2:					
Elliott	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness

Table 11.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
147A: Clarence	Severe: percs slowly, wetness	Severe: percs slowly	Severe: percs slowly, wetness	Moderate: wetness	Moderate: wetness
147B2: Clarence	Severe: percs slowly, wetness	Severe: percs slowly	Severe: percs slowly, wetness	Moderate: wetness	Moderate: wetness
148B: Proctor	Slight	Slight	Moderate: slope	Slight	Slight
148B2: Proctor	Slight	Slight	Moderate: slope	Slight	Slight
149A: Brenton	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
150B: Onarga	Slight	Slight	Moderate: slope	Slight	Slight
151A: Ridgeville	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
152A: Drummer	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
153A: Pella	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
189A: Martinton	Severe: wetness	Moderate: percs slowly, wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
192A: Del Rey	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
221C2: Parr	Moderate: percs slowly, wetness	Moderate: percs slowly, wetness	Severe: slope	Slight	Slight
221C3: Parr	Moderate: percs slowly, wetness	Moderate: percs slowly, wetness	Severe: slope	Slight	Slight
223B2: Varna	Moderate: percs slowly, wetness	Moderate: percs slowly, wetness	Moderate: percs slowly, slope, wetness	Slight	Slight

Table 11.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
223C2:					
Varna	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Slight	Slight
230A:					
Rowe	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: ponding	Severe: ponding
232A:					
Ashkum	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
235A:					
Bryce	Severe: too clayey ponding	Severe: too clayey ponding	Severe: too clayey ponding	Severe: too clayey ponding	Severe: too clayey ponding
238A:					
Rantoul	Severe: percs slowly too clayey ponding	Severe: percs slowly too clayey ponding	Severe: percs slowly too clayey ponding	Severe: too clayey ponding	Severe: too clayey ponding
241C3:					
Chatsworth	Severe: percs slowly too clayey	Severe: percs slowly too clayey	Severe: percs slowly too clayey	Severe: too clayey	Severe: too clayey
241D3:					
Chatsworth	Severe: percs slowly too clayey	Severe: percs slowly too clayey	Severe: percs slowly slope too clayey	Severe: too clayey	Severe: too clayey
294B:					
Symerton	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Slight	Slight
295A:					
Mokena	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
330A:					
Peotone	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
375A:					
Rutland	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
375B:					
Rutland	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness

Table 11.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
481A:					
Raub	Severe: wetness	Moderate: percs slowly, wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
530B:					
Ozaukee	Moderate: percs slowly, wetness	Moderate: percs slowly, wetness	Moderate: percs slowly, slope, wetness	Slight	Slight
530D2:					
Ozaukee	Moderate: percs slowly, slope, wetness	Moderate: percs slowly, slope, wetness	Severe: slope	Slight	Moderate: slope
530E2:					
Ozaukee	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: slope
541B2:					
Graymont	Moderate: percs slowly, wetness	Moderate: percs slowly, wetness	Moderate: percs slowly, slope, wetness	Slight	Slight
570C2:					
Martinsville	Slight	Slight	Severe: slope	Slight	Slight
614A:					
Chenoa	Severe: wetness	Moderate: percs slowly, wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
687B:					
Penfield	Slight	Slight	Moderate: slope	Slight	Slight
802B:					
Orthents, loamy	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly, slope	Slight	Slight
805B:					
Orthents, clayey	Severe: percs slowly, too clayey	Severe: percs slowly, too clayey	Severe: too clayey	Severe: too clayey	Severe: too clayey
865.					
Pits, gravel					
1103A:					
Houghton	Severe: excess humus, ponding	Severe: excess humus, ponding	Severe: excess humus, ponding	Severe: excess humus, ponding	Severe: excess humus, ponding
3107A:					
Sawmill	Severe: flooding, ponding	Severe: ponding	Severe: flooding, ponding	Severe: ponding	Severe: flooding, ponding

Table 11.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
3405A: Zook	Severe: flooding, too clayey, ponding	Severe: too clayey, ponding	Severe: flooding, too clayey, ponding	Severe: too clayey, ponding	Severe: too clayey, ponding, flooding

Table 12.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
23A:										
Blount	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
23B2:										
Blount	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
56B:										
Dana	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
56B2:										
Dana	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
67A:										
Harpster	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
69A:										
Milford	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
91A:										
Swygert	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
91B2:										
Swygert	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
102A:										
La Hogue	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
125A:										
Selma	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
134A:										
Camden	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
146A:										
Elliott	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
146B2:										
Elliott	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
147A:										
Clarence	Fair	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair
147B2:										
Clarence	Fair	Good	Good	Fair	Fair	Fair	Poor	Good	Fair	Poor
148B:										
Proctor	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
148B2:										
Proctor	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
149A:										
Brenton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair

Table 12.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
150B: Onarga	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
151A: Ridgeville	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
152A: Drummer	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
153A: Pella	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
189A: Martinton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
192A: Del Rey	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
221C2: Parr	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
221C3: Parr	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
223B2: Varna	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
223C2: Varna	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
230A: Rowe	Fair	Fair	Poor	Fair	Fair	Good	Good	Fair	Fair	Good
232A: Ashkum	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
235A: Bryce	Fair	Fair	Poor	Fair	Fair	Good	Good	Fair	Fair	Good
238A: Rantoul	Fair	Fair	Poor	Fair	Fair	Good	Good	Fair	Fair	Good
241C3: Chatsworth	Poor	Fair	Fair	Poor	Poor	Poor	Very poor	Fair	Poor	Very poor
241D3: Chatsworth	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor
294B: Symerton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
295A: Mokena	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
330A: Peotone	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good

Table 12.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
375A: Rutland	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
375B: Rutland	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
481A: Raub	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
530B: Ozaukee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
530D2: Ozaukee	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
530E2: Ozaukee	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
541B2: Graymont	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
570C2: Martinsville	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
614A: Chenoa	Good	Good	Good	Good	Good	Fair	Fair	Good	Poor	Fair
687B: Penfield	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
802B: Orthents, loamy	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
805B: Orthents, clayey	Fair	Fair	Fair	Fair	Fair	Poor	Very poor	Fair	Fair	Very poor
865. Pits, gravel										
1103A: Houghton	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
3107A: Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
3405A: Zook	Poor	Fair	Poor	Fair	Fair	Good	Good	Poor	Fair	Good

Table 13.--Hydric Soils

(See text for explanation of terms used in this table)

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
23A:				
Blount silt loam, 0 to 2 percent slopes	Blount	No	ground moraine, end moraine	summit, footslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
23B2:				
Blount silt loam, 2 to 4 percent slopes, eroded	Blount	No	ground moraine, end moraine	summit, backslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
56B:				
Dana silt loam, 2 to 5 percent slopes	Dana	No	ground moraine, end moraine	summit, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
56B2:				
Dana silt loam, 2 to 5 percent slopes, eroded	Dana	No	ground moraine, end moraine	summit, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
67A:				
Harpster silty clay loam, 0 to 2 percent slopes	Harpster	Yes	outwash plain, ground moraine, lake plain	toeslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
	Houghton	Yes	ground moraine, outwash plain	toeslope
69A:				
Milford silty clay loam, 0 to 2 percent slopes	Milford	Yes	lake plain	toeslope
	Houghton	Yes	ground moraine, outwash plain	toeslope

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
91A:				
Swygert silty clay loam, 0 to 2 percent slopes	Swygert	No	ground moraine, lake plain	summit, footslope
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope
91B2:				
Swygert silty clay loam, 2 to 4 percent slopes, eroded	Swygert	No	ground moraine, glacial lake (relict)	backslope, footslope
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope
102A:				
La Hogue loam, 0 to 2 percent slopes	La Hogue	No	outwash plain, stream terrace	summit, footslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
125A:				
Selma loam, 0 to 2 percent slopes	Selma	Yes	outwash plain, stream terrace	toeslope
	Houghton	Yes	ground moraine, outwash plain	toeslope
134A:				
Camden silt loam, 0 to 2 percent slopes	Camden	No	outwash plain, stream terrace	summit
	Drummer	Yes	outwash plain, ground moraine	toeslope
146A:				
Elliott silt loam, 0 to 2 percent slopes	Elliott	No	ground moraine, end moraine	summit, footslope
	Ashkum	Yes	ground moraine, end moraine	toeslope

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
146B2:				
Elliott silty clay loam, 2 to 4 percent slopes, eroded	Elliott	No	ground moraine, end moraine	backslope, footslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
147A:				
Clarence silty clay loam, 0 to 2 percent slopes	Clarence	No	ground moraine	summit, footslope
	Rowe	Yes	ground moraine, lake plain	toeslope
147B2:				
Clarence silty clay loam, 2 to 4 percent slopes, eroded	Clarence	No	ground moraine	backslope, footslope
	Rowe	Yes	ground moraine, lake plain	toeslope
148B:				
Proctor silt loam, 2 to 5 percent slopes	Proctor	No	outwash plain	summit, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
148B2:				
Proctor silt loam, 2 to 5 percent slopes, eroded	Proctor	No	outwash plain, stream terrace	summit, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
149A:				
Brenton silt loam, 0 to 2 percent slopes	Brenton	No	outwash plain, stream terrace	summit, footslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
150B:				
Onarga fine sandy loam, 2 to 5 percent slopes	Onarga	No	outwash plain, beach ridge	summit, backslope
	Selma	Yes	outwash plain, stream terrace	toeslope

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
151A:				
Ridgeville fine sandy loam, 0 to 2 percent slopes	Ridgeville	No	outwash plain, beach ridge	summit, footslope
	Selma	Yes	outwash plain, stream terrace	toeslope
152A:				
Drummer silty clay loam, 0 to 2 percent slopes	Drummer	Yes	outwash plain, ground moraine	toeslope
	Peotone	Yes	ground moraine	toeslope
	Harpster	Yes	outwash plain, ground moraine	toeslope
153A:				
Pella silty clay loam, 0 to 2 percent slopes	Pella	Yes	outwash plain, lake plain	toeslope
189A:				
Martinton silt loam, 0 to 2 percent slopes	Martinton	No	lake plain	summit, footslope
	Milford	Yes	lake plain	toeslope
192A:				
Del Rey silt loam, 0 to 2 percent slopes	Del Rey	No	lake plain	summit, footslope
	Milford	Yes	lake plain	toeslope
221C2:				
Parr silt loam, 5 to 10 percent slopes, eroded	Parr	No	ground moraine, end moraine	shoulder, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
221C3:				
Parr clay loam, 5 to 10 percent slopes, severely eroded	Parr	No	ground moraine, end moraine	backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
223B2:				
Varna silt loam, 2 to 4 percent slopes, eroded	Varna	No	ground moraine, end moraine	summit, backslope
	Ashkum	Yes	ground moraine, end moraine	toeslope

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
223C2:				
Varna silt loam, 4 to 6 percent slopes, eroded	Varna	No	ground moraine, end moraine	shoulder, backslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
230A:				
Rowe silty clay loam, 0 to 2 percent slopes	Rowe	Yes	ground moraine, lake plain	toeslope
	Rantoul	Yes	ground moraine, lake plain	toeslope
232A:				
Ashkum silty clay loam, 0 to 2 percent slopes	Ashkum	Yes	ground moraine, end moraine	toeslope
	Houghton	Yes	ground moraine, outwash plain	toeslope
235A:				
Bryce silty clay, 0 to 2 percent slopes	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope
	Rantoul	Yes	ground moraine, lake plain	toeslope
238A:				
Rantoul silty clay, 0 to 2 percent slopes	Rantoul	Yes	ground moraine, lake plain	toeslope
	Houghton	Yes	ground moraine, outwash plain	toeslope
241C3:				
Chatsworth silty clay, 4 to 6 percent slopes, severely eroded	Chatsworth	No	ground moraine, end moraine	backslope
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
241D3:				
Chatsworth silty clay, 6 to 12 percent slopes, severely eroded	Chatsworth	No	ground moraine, end moraine	backslope
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope
294B:				
Symerton silt loam, 2 to 5 percent slopes	Symerton	No	ground moraine, lake plain	summit, backslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
295A:				
Mokena silt loam, 0 to 2 percent slopes	Mokena	No	ground moraine, lake plain	summit, footslope
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope
330A:				
Peotone silty clay loam, 0 to 2 percent slopes	Peotone	Yes	ground moraine	toeslope
	Houghton	Yes	ground moraine, outwash plain	toeslope
375A:				
Rutland silty clay loam, 0 to 2 percent slopes	Rutland	No	ground moraine, lake plain	summit, footslope
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope
375B:				
Rutland silty clay loam, 2 to 5 percent slopes	Rutland	No	ground moraine, lake plain	backslope, footslope
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
481A:				
Raub silt loam, 0 to 2 percent slopes	Raub	No	ground moraine, end moraine	summit, footslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
530B:				
Ozaukee silt loam, 2 to 4 percent slopes	Ozaukee	No	ground moraine, end moraine	summit, backslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
530D2:				
Ozaukee silt loam, 6 to 12 percent slopes, eroded	Ozaukee	No	end moraine, ground moraine	shoulder, backslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
530E2:				
Ozaukee silt loam, 12 to 20 percent slopes, eroded	Ozaukee	No	ground moraine, end moraine	backslope
	Sawmill	Yes	flood plain	---
541B2:				
Graymont silt loam, 2 to 5 percent slopes, eroded	Graymont	No	ground moraine	summit, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
570C2:				
Martinsville loam, 5 to 10 percent slopes, eroded	Martinsville	No	stream terrace, outwash plain	backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
	Sawmill	Yes	flood plain	---
614A:				
Chenoa silty clay loam, 0 to 2 percent slopes	Chenoa	No	ground moraine, end moraine	summit, footslope
	Drummer	Yes	outwash plain, ground moraine	toeslope

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
687B:				
Penfield loam, 2 to 5 percent slopes	Penfield	No	outwash plain, ground moraine	summit, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
802B:				
Orthents, loamy, undulating	Orthents, loamy	No	outwash plain, ground moraine	summit, backslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
805B:				
Orthents, clayey, undulating	Orthents, clayey	No	ground moraine, lake plain	summit, backslope
	Ashkum	Yes	ground moraine, end moraine	toeslope
	Houghton	Yes	ground moraine, outwash plain	toeslope
	Peotone	Yes	ground moraine	toeslope
865:				
Pits, gravel	Pits, gravel	N/A	---	---
	Drummer	Yes	outwash plain, ground moraine	toeslope
1103A:				
Houghton muck, undrained, 0 to 2 percent slopes	Houghton	Yes	ground moraine, outwash plain	toeslope
	Drummer	Yes	outwash plain, ground moraine	toeslope
3107A:				
Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	Sawmill	Yes	flood plain	---

Table 13.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform	Position on landform
3405A: Zook silty clay, 0 to 2 percent slopes, frequently flooded	Zook	Yes	flood plain	---
	Bryce	Yes	ground moraine, glacial lake (relict)	toeslope

Table 14.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
23A:						
Blount	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength wetness	Severe: wetness
23B2:						
Blount	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength wetness	Severe: wetness
56B:						
Dana	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Slight
56B2:						
Dana	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Slight
67A:						
Harpster	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: frost action low strength ponding	Severe: ponding
69A:						
Milford	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: frost action low strength ponding	Severe: ponding
91A:						
Swygert	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell	Moderate: wetness
91B2:						
Swygert	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell	Moderate: wetness
102A:						
La Hogue	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: low strength shrink-swell wetness	Moderate: wetness
125A:						
Selma	Severe: ponding cutbanks cave	Severe: ponding	Severe: ponding	Severe: ponding	Severe: frost action ponding	Severe: ponding
134A:						
Camden	Severe: cutbanks cave	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: frost action low strength	Slight

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
146A: Elliott	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength	Moderate: wetness
146B2: Elliott	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength	Moderate: wetness
147A: Clarence	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength	Moderate: wetness
147B2: Clarence	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength	Moderate: wetness
148B: Proctor	Severe: cutbanks cave	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Severe: frost action low strength	Slight
148B2: Proctor	Severe: cutbanks cave	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: frost action low strength	Slight
149A: Brenton	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
150B: Onarga	Severe: cutbanks cave	Slight	Slight	Slight	Moderate: frost action	Slight
151A: Ridgeville	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: frost action wetness	Moderate: wetness
152A: Drummer	Severe: ponding cutbanks cave	Severe: ponding	Severe: ponding	Severe: ponding	Severe: frost action low strength ponding	Severe: ponding
153A: Pella	Severe: ponding cutbanks cave	Severe: ponding	Severe: ponding	Severe: ponding	Severe: frost action low strength ponding	Severe: ponding
189A: Martinton	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength	Moderate: wetness
192A: Del Rey	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength wetness	Severe: wetness

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
221C2:						
Parr	Severe: wetness	Moderate: wetness, shrink-swell	Severe: wetness	Moderate: shrink-swell, slope, wetness	Severe: low strength	Slight
221C3:						
Parr	Severe: wetness	Moderate: shrink-swell, wetness	Severe: wetness	Moderate: shrink-swell, slope, wetness	Severe: low strength	Slight
223B2:						
Varna	Severe: wetness	Moderate: shrink-swell, wetness	Severe: wetness	Moderate: shrink-swell, wetness	Severe: low strength	Slight
223C2:						
Varna	Severe: wetness	Moderate: shrink-swell, wetness	Severe: wetness	Moderate: shrink-swell, slope, wetness	Severe: low strength	Slight
230A:						
Rowe	Severe: ponding	Severe: shrink-swell, ponding	Severe: shrink-swell, ponding	Severe: shrink-swell, ponding	Severe: low strength, shrink-swell, ponding	Severe: ponding
232A:						
Ashkum	Severe: ponding	Severe: shrink-swell, ponding	Severe: ponding	Severe: shrink-swell, ponding	Severe: low strength, shrink-swell, ponding	Severe: ponding
235A:						
Bryce	Severe: ponding	Severe: shrink-swell, ponding	Severe: shrink-swell, ponding	Severe: shrink-swell, ponding	Severe: low strength, shrink-swell, ponding	Severe: too clayey, ponding
238A:						
Rantoul	Severe: ponding	Severe: shrink-swell, ponding	Severe: shrink-swell, ponding	Severe: shrink-swell, ponding	Severe: low strength, shrink-swell, ponding	Severe: too clayey, ponding
241C3:						
Chatsworth	Severe: wetness	Moderate: shrink-swell, wetness	Severe: wetness	Moderate: shrink-swell, slope, wetness	Severe: low strength	Severe: too clayey
241D3:						
Chatsworth	Severe: wetness	Moderate: shrink-swell, slope, wetness	Severe: wetness	Severe: slope	Severe: low strength	Severe: too clayey
294B:						
Symerton	Severe: wetness	Moderate: shrink-swell, wetness	Severe: wetness	Moderate: shrink-swell, wetness	Severe: low strength	Slight

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
295A:						
Mokena	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength	Moderate: wetness
330A:						
Peotone	Severe: ponding	Severe: shrink-swell ponding	Severe: shrink-swell ponding	Severe: shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: ponding
375A:						
Rutland	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell	Moderate: wetness
375B:						
Rutland	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell	Moderate: wetness
481A:						
Raub	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
530B:						
Ozaukee	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: low strength	Slight
530D2:						
Ozaukee	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: wetness	Severe: slope	Severe: low strength	Moderate: slope
530E2:						
Ozaukee	Severe: slope wetness	Severe: slope	Severe: slope wetness	Severe: slope	Severe: low strength slope	Severe: slope
541B2:						
Graymont	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Slight
570C2:						
Martinsville	Severe: cutbanks cave	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell slope	Moderate: frost action low strength shrink-swell	Slight
614A:						
Chenoa	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength	Moderate: wetness
687B:						
Penfield	Severe: cutbanks cave	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Moderate: frost action low strength shrink-swell	Slight

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
802B: Orthents, loamy	Moderate: wetness	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Severe: low strength	Slight
805B: Orthents, clayey	Severe: wetness	Severe: shrink-swell	Severe: shrink-swell wetness	Severe: shrink-swell	Severe: low strength	Severe: too clayey
865. Pits, gravel						
1103A: Houghton	Severe: excess humus ponding	Severe: low strength subsides ponding	Severe: low strength subsides ponding	Severe: low strength subsides ponding	Severe: frost action subsides ponding	Severe: excess humus ponding
3107A: Sawmill	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding low strength ponding	Severe: flooding ponding
3405A: Zook	Severe: ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: too clayey ponding flooding

Table 15.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
23A:					
Blount	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: wetness
23B2:					
Blount	Severe: percs slowly wetness	Moderate: slope	Severe: wetness	Severe: wetness	Poor: wetness
56B:					
Dana	Severe: percs slowly wetness	Severe: wetness	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness
56B2:					
Dana	Severe: percs slowly wetness	Severe: wetness	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness
67A:					
Harpster	Severe: ponding	Severe: seepage ponding	Severe: seepage ponding	Severe: ponding	Poor: hard to pack ponding
69A:					
Milford	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
91A:					
Swygert	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
91B2:					
Swygert	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
102A:					
La Hogue	Severe: wetness	Severe: seepage wetness	Severe: seepage wetness	Severe: wetness	Poor: wetness
125A:					
Selma	Severe: ponding	Severe: seepage ponding	Severe: seepage ponding	Severe: ponding	Poor: ponding
134A:					
Camden	Moderate: percs slowly	Severe: seepage	Severe: seepage	Slight	Fair: too clayey

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
146A:					
Elliott	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: too clayey wetness
146B2:					
Elliott	Severe: percs slowly wetness	Moderate: slope	Severe: wetness	Severe: wetness	Poor: wetness
147A:					
Clarence	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
147B2:					
Clarence	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
148B:					
Proctor	Moderate: percs slowly	Severe: seepage	Severe: seepage	Slight	Fair: too sandy
148B2:					
Proctor	Moderate: percs slowly	Severe: seepage	Severe: seepage	Slight	Fair: too clayey
149A:					
Brenton	Severe: wetness	Severe: seepage wetness	Severe: seepage wetness	Severe: wetness	Poor: wetness
150B:					
Onarga	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage too sandy
151A:					
Ridgeville	Severe: wetness poor filter	Severe: seepage wetness	Severe: seepage too sandy wetness	Severe: seepage wetness	Poor: wetness
152A:					
Drummer	Severe: ponding	Severe: seepage ponding	Severe: seepage ponding	Severe: ponding	Poor: ponding
153A:					
Pella	Severe: ponding	Severe: seepage ponding	Severe: seepage ponding	Severe: ponding	Poor: ponding
189A:					
Martinton	Severe: percs slowly wetness	Severe: wetness	Severe: too clayey wetness	Severe: wetness	Poor: too clayey wetness

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
192A:					
Del Rey	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
221C2:					
Parr	Severe: percs slowly wetness	Severe: slope wetness	Moderate: wetness	Moderate: wetness	Fair: wetness
221C3:					
Parr	Severe: percs slowly wetness	Severe: slope wetness	Moderate: wetness	Moderate: wetness	Fair: wetness
223B2:					
Varna	Severe: percs slowly wetness	Moderate: slope	Moderate: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
223C2:					
Varna	Severe: percs slowly wetness	Moderate: slope	Moderate: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
230A:					
Rowe	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
232A:					
Ashkum	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Poor: ponding
235A:					
Bryce	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
238A:					
Rantoul	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
241C3:					
Chatsworth	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey	Moderate: wetness	Poor: hard to pack too clayey
241D3:					
Chatsworth	Severe: percs slowly wetness	Severe: slope	Severe: too clayey	Moderate: slope wetness	Poor: hard to pack too clayey
294B:					
Symerton	Severe: percs slowly wetness	Moderate: seepage slope	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
295A:					
Mokena	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: wetness
330A:					
Peotone	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
375A:					
Rutland	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
375B:					
Rutland	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
481A:					
Raub	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
530B:					
Ozaukee	Severe: percs slowly wetness	Moderate: slope	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness
530D2:					
Ozaukee	Severe: percs slowly wetness	Severe: slope	Moderate: slope too clayey wetness	Moderate: slope wetness	Fair: slope too clayey wetness
530E2:					
Ozaukee	Severe: percs slowly slope wetness	Severe: slope	Severe: slope	Severe: slope	Poor: slope
541B2:					
Graymont	Severe: percs slowly wetness	Moderate: seepage slope	Moderate: too clayey wetness	Moderate: wetness	Poor: hard to pack
570C2:					
Martinsville	Slight	Severe: seepage slope	Severe: seepage	Slight	Good
614A:					
Chenoa	Severe: percs slowly wetness	Moderate: seepage	Severe: wetness	Severe: wetness	Poor: hard to pack wetness

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
687B: Penfield	Moderate: percs slowly wetness	Moderate: seepage slope wetness	Severe: seepage wetness	Moderate: wetness	Good
802B: Orthents, loamy	Severe: percs slowly wetness	Moderate: slope wetness	Moderate: too clayey wetness	Slight	Fair: too clayey
805B: Orthents, clayey	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey	Moderate: wetness	Poor: hard to pack too clayey
865. Pits, gravel					
1103A: Houghton	Severe: percs slowly subsides ponding	Severe: excess humus seepage ponding	Severe: excess humus seepage ponding	Severe: seepage ponding	Poor: excess humus ponding
3107A: Sawmill	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Poor: ponding
3405A: Zook	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding

Table 16.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
23A:				
Blount	Poor: low strength, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
23B2:				
Blount	Poor: low strength, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
56B:				
Dana	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
56B2:				
Dana	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
67A:				
Harpster	Poor: low strength, wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
69A:				
Milford	Poor: low strength, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
91A:				
Swygert	Poor: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
91B2:				
Swygert	Poor: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
102A:				
La Hogue	Fair: low strength, shrink-swell, wetness	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
125A:				
Selma	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
134A:				
Camden	Fair: shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
146A:				
Elliott	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
146B2:				
Elliott	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
147A: Clarence	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
147B2: Clarence	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
148B: Proctor	Good	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
148B2: Proctor	Fair: shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
149A: Brenton	Fair: shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
150B: Onarga	Good	Probable	Improbable: too sandy	Fair: area reclaim thin layer
151A: Ridgeville	Fair: wetness	Probable	Improbable: too sandy	Good
152A: Drummer	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
153A: Pella	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
189A: Martinton	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
192A: Del Rey	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
221C2: Parr	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Fair: area reclaim small stones too clayey
221C3: Parr	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Fair: area reclaim small stones too clayey

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
223B2:				
Varna	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
223C2:				
Varna	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
230A:				
Rowe	Poor: low strength, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
232A:				
Ashkum	Poor: low strength, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
235A:				
Bryce	Poor: low strength, shrink-swell, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
238A:				
Rantoul	Poor: low strength, shrink-swell, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
241C3:				
Chatsworth	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim, too clayey
241D3:				
Chatsworth	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim, too clayey
294B:				
Symerton	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones
295A:				
Mokena	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones, too clayey
330A:				
Peotone	Poor: low strength, shrink-swell, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness
375A:				
Rutland	Poor: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
375B:				
Rutland	Poor: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
481A: Raub	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
530B: Ozaukee	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
530D2: Ozaukee	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
530E2: Ozaukee	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: slope, too clayey
541B2: Graymont	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
570C2: Martinsville	Fair: shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: small stones, too clayey
614A: Chenoa	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
687B: Penfield	Fair: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
802B: Orthents, loamy	Fair: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: small stones, too clayey
805B: Orthents, clayey	Poor: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
865. Pits, gravel				
1103A: Houghton	Poor: low strength, wetness	Improbable: excess humus	Improbable: excess humus	Poor: excess humus, wetness
3107A: Sawmill	Poor: low strength, wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
3405A: Zook	Poor: low strength, shrink-swell, wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey, wetness

Table 17.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
23A:							
Blount	Slight	Severe: wetness	Severe: no water	Limitation: frost action, percs slowly	Limitation: percs slowly, wetness	Limitation: erodes easily, percs slowly, wetness	Limitation: erodes easily, rooting depth, wetness
23B2:							
Blount	Moderate: slope	Severe: wetness	Severe: no water	Limitation: frost action, percs slowly	Limitation: percs slowly, wetness	Limitation: erodes easily, percs slowly, wetness	Limitation: erodes easily, rooting depth, wetness
56B:							
Dana	Moderate: seepage, slope	Moderate: wetness	Severe: no water	Limitation: frost action, slope	Limitation: slope	Limitation: erodes easily, wetness	Limitation: erodes easily, rooting depth
56B2:							
Dana	Moderate: seepage, slope	Moderate: wetness	Severe: no water	Limitation: frost action, slope	Limitation: slope	Limitation: erodes easily, wetness	Limitation: erodes easily, rooting depth
67A:							
Harpster	Severe: seepage	Severe: ponding	Moderate: slow refill	Limitation: frost action, ponding	Limitation: ponding	Limitation: erodes easily, ponding	Limitation: erodes easily, wetness
69A:							
Milford	Slight	Severe: ponding	Severe: slow refill	Limitation: frost action, ponding	Limitation: ponding	Limitation: erodes easily, ponding	Limitation: erodes easily, wetness
91A:							
Swygert	Slight	Moderate: hard to pack, wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly, wetness	Limitation: percs slowly, wetness	Limitation: percs slowly, rooting depth, wetness
91B2:							
Swygert	Moderate: slope	Moderate: hard to pack, wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly, wetness	Limitation: percs slowly, wetness	Limitation: percs slowly, rooting depth, wetness

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
102A:							
La Hogue	Severe: seepage	Severe: wetness	Severe: cutbanks cave	Favorable	Limitation: wetness	Limitation: wetness	Limitation: wetness
125A:							
Selma	Severe: seepage	Severe: ponding	Severe: cutbanks cave	Limitation: frost action ponding	Limitation: ponding	Limitation: ponding	Limitation: wetness
134A:							
Camden	Severe: seepage	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
146A:							
Elliott	Slight	Moderate: hard to pack piping wetness	Severe: no water	Favorable	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily rooting depth wetness
146B2:							
Elliott	Moderate: slope	Moderate: piping wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily rooting depth wetness
147A:							
Clarence	Slight	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness droughty	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily rooting depth wetness
147B2:							
Clarence	Moderate: slope	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness droughty	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily rooting depth wetness
148B:							
Proctor	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
148B2:							
Proctor	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
149A:							
Brenton	Severe: seepage	Severe: wetness	Severe: cutbanks cave	Limitation: frost action	Limitation: wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
150B:							
Onarga	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: too sandy soil blowing	Favorable
151A:							
Ridgeville	Severe: seepage	Severe: seepage piping wetness	Severe: cutbanks cave	Favorable	Limitation: wetness soil blowing	Limitation: wetness soil blowing	Limitation: wetness
152A:							
Drummer	Severe: seepage	Severe: ponding	Severe: cutbanks cave	Limitation: frost action ponding	Limitation: ponding	Limitation: erodes easily ponding	Limitation: erodes easily wetness
153A:							
Pella	Severe: seepage	Severe: ponding	Severe: cutbanks cave	Limitation: frost action ponding	Limitation: ponding	Limitation: erodes easily ponding	Limitation: erodes easily wetness
189A:							
Martinton	Slight	Severe: wetness	Severe: slow refill	Favorable	Limitation: wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
192A:							
Del Rey	Slight	Severe: wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
221C2:							
Parr	Moderate: seepage slope	Moderate: piping wetness	Severe: no water	Limitation: slope	Limitation: slope	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth
221C3:							
Parr	Moderate: seepage slope	Moderate: piping wetness	Severe: no water	Limitation: slope	Limitation: slope	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
223B2:							
Varna	Moderate: slope	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly rooting depth
223C2:							
Varna	Moderate: slope	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly rooting depth
230A:							
Rowe	Slight	Severe: hard to pack ponding	Severe: slow refill	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
232A:							
Ashkum	Slight	Severe: ponding	Severe: slow refill	Limitation: frost action ponding	Limitation: ponding	Limitation: erodes easily ponding	Limitation: erodes easily wetness
235A:							
Bryce	Slight	Severe: ponding	Severe: slow refill	Limitation: frost action percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
238A:							
Rantoul	Slight	Severe: hard to pack ponding	Severe: slow refill	Limitation: percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
241C3:							
Chatsworth	Moderate: slope	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly slope	Limitation: slope slow intake droughty	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily rooting depth droughty
241D3:							
Chatsworth	Severe: slope	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly slope	Limitation: slope slow intake droughty	Limitation: erodes easily slope wetness	Limitation: erodes easily slope droughty

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
294B: Symerton	Moderate: seepage slope	Moderate: wetness	Severe: no water	Limitation: percs slowly slope	Limitation: slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily
295A: Mokena	Slight	Moderate: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: percs slowly wetness	Limitation: percs slowly rooting depth wetness
330A: Peotone	Slight	Severe: ponding	Severe: slow refill	Limitation: frost action ponding	Limitation: ponding	Limitation: erodes easily ponding	Limitation: erodes easily wetness
375A: Rutland	Slight	Severe: wetness	Severe: no water	Favorable	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
375B: Rutland	Moderate: slope	Severe: wetness	Severe: no water	Limitation: slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
481A: Raub	Slight	Moderate: wetness	Severe: no water	Limitation: frost action	Limitation: wetness	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth wetness
530B: Ozaukee	Moderate: slope	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly rooting depth
530D2: Ozaukee	Severe: slope	Moderate: wetness	Severe: no water	Limitation: percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily rooting depth slope

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
530E2:							
Ozaukee	Severe: slope	Moderate: wetness	Severe: no water	Limitation: percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily rooting depth slope
541B2:							
Graymont	Moderate: seepage slope	Moderate: hard to pack piping wetness	Severe: no water	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly rooting depth
570C2:							
Martinsville	Severe: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Favorable
614A:							
Chenoa	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness rooting depth
687B:							
Penfield	Moderate: seepage slope	Moderate: piping wetness	Moderate: slow refill deep to water	Limitation: deep to water	Limitation: slope	Favorable	Favorable
802B:							
Orthents, loamy	Moderate: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily rooting depth
805B:							
Orthents, clayey	Moderate: slope	Severe: hard to pack	Severe: no water	Limitation: percs slowly slope	Limitation: slope slow intake wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily rooting depth droughty
865.							
Pits, gravel							
1103A:							
Houghton	Severe: seepage	Severe: excess humus ponding	Severe: slow refill	Limitation: ponding subsides frost action	Limitation: soil blowing ponding	Limitation: soil blowing ponding	Limitation: wetness

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
3107A: Sawmill	Moderate: seepage	Severe: ponding	Moderate: slow refill	Limitation: flooding frost action ponding	Limitation: flooding ponding	Limitation: ponding	Limitation: wetness
3405A: Zook	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness

Table 18.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
23A:												
Blount	0-7	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	7-13	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	20-35	8-18
	13-26	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	26-32	Silty clay loam, clay loam, silty clay	CH, CL, ML	A-6, A-7	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	32-60	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
23B2:												
Blount	0-4	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	4-16	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	16-31	Silty clay loam, clay loam, silty clay	CH, ML, CL	A-6, A-7	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	31-60	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
56B:												
Dana	0-11	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	30-35	8-15
	11-32	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	20-35
	32-58	Clay loam	CL	A-6, A-7	0	0-3	90-98	90-98	80-90	55-80	30-50	15-30
	58-80	Loam, clay loam	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	80-98	75-85	50-80	15-30	5-15
56B2:												
Dana	0-7	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	30-35	8-15
	7-34	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	20-35
	34-53	Clay loam	CL	A-6, A-7	0	0-3	90-98	90-98	80-90	55-80	30-50	15-30
	53-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	80-98	75-85	50-80	15-30	5-15

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
67A:												
Harpster	0-18	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	85-100	45-60	20-35
	18-36	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	85-100	40-60	20-35
	36-41	Silty clay loam, silt loam, loam	CH, CL	A-6, A-7	0	0	100	95-100	95-100	65-100	35-55	20-35
	41-60	Stratified sandy loam to clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	0	100	95-100	90-100	45-95	20-50	5-25
69A:												
Milford	0-18	Silty clay loam	CH, CL	A-7	0	0	100	95-100	90-100	75-95	40-55	20-30
	18-50	Silty clay, silty clay loam, clay loam	CH, CL	A-7	0	0	100	95-100	90-100	75-100	40-60	20-40
	50-60	Stratified sandy loam to silty clay loam	CL, SC	A-6, A-7	0	0	95-100	95-100	90-100	45-100	25-50	10-30
91A:												
Swygert	0-12	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	12-18	Silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-55	15-30
	18-51	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	51-60	Silty clay loam, silty clay, clay	CH, CL	A-7	0	0-5	95-100	95-100	90-100	75-95	40-65	20-40
91B2:												
Swygert	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	7-12	Silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-55	15-30
	12-48	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	48-60	Silty clay loam, silty clay, clay	CH, CL	A-7	0	0-5	95-100	95-100	90-100	75-95	40-65	20-40

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
102A:												
La Hogue	0-16	Loam	ML, CL-ML, CL	A-4	0	0	100	95-100	80-100	50-75	20-35	3-10
	16-43	Clay loam, silty clay loam, sandy loam	CL, SC	A-4, A-6	0	0	100	90-100	80-100	40-85	25-40	8-20
	43-80	Stratified loamy sand to silt loam	SM, SC, ML, CL	A-2-4, A-4, A-6	0	0	100	80-100	75-90	15-85	15-30	2-15
125A:												
Selma	0-6	Loam	CL	A-4, A-6	0	0	100	95-100	80-100	55-85	25-35	7-17
	6-13	Clay loam	CL	A-6	0	0	100	95-100	80-100	55-85	25-40	8-20
	13-44	Loam, silty clay loam, sandy loam	CL, SC	A-6	0	0	100	85-100	80-95	38-85	24-36	11-19
	44-80	Stratified sand to silt loam	CL, CL-ML, SC, SC-SM	A-4, A-2, A-6	0	0	90-100	80-100	60-90	10-70	15-35	5-20
134A:												
Camden	0-8	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	8-13	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	13-38	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	38-56	Clay loam, silt loam, sandy loam	ML, CL, SM, SC	A-2, A-4, A-6	0	0-5	90-100	85-100	60-100	30-85	20-40	3-15
	56-60	Stratified loamy sand to silt loam	SM, SC, ML, CL	A-2-4, A-4	0	0-5	90-100	80-100	50-85	15-85	15-25	3-10
146A:												
Elliott	0-6	Silt loam	CL	A-4, A-6	0	0	95-100	95-100	90-100	80-100	30-40	8-18
	6-11	Silty clay loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-100	80-100	30-50	11-20
	11-41	Silty clay, silty clay loam, clay	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-96	30-52	11-26
	41-60	Silty clay loam, clay loam	CL	A-6, A-7	0	0-5	90-100	80-100	75-100	65-95	28-45	11-24

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
146B2:												
Elliott	0-8	Silty clay loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	80-100	30-50	11-20
	8-27	Silty clay, silty clay loam, clay	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-96	30-52	11-26
	27-60	Silty clay loam, clay loam	CL	A-6, A-7	0	0-5	90-100	80-100	75-100	65-95	28-45	11-24
147A:												
Clarence	0-11	Silty clay loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	85-100	30-45	15-25
	11-39	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	85-100	50-65	25-40
	39-60	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	95-100	90-100	85-100	45-65	25-40
147B2:												
Clarence	0-8	Silty clay loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	85-100	30-45	15-25
	8-35	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	85-100	50-65	25-40
	35-60	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	95-100	90-100	85-100	45-65	25-40
148B:												
Proctor	0-11	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	11-28	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-50	10-25
	28-33	Clay loam, sandy loam, loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	90-100	85-100	75-100	30-85	20-45	5-25
	33-60	Stratified loamy sand to loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	85-100	80-100	50-100	15-85	20-40	5-20
148B2:												
Proctor	0-11	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	11-26	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-50	10-25
	26-40	Clay loam, silty clay loam, sandy loam	CL-ML, CL, SC-SM, SC	A-4, A-6, A-7, A-2	0	0	90-100	85-100	75-100	25-90	20-45	5-25
	40-60	Stratified loamy sand to silt loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0	85-100	80-100	50-100	15-85	20-40	5-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
149A:												
Brenton	0-16	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	30-40	8-15
	16-35	Silty clay loam, silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	35-53	Clay loam, silt loam, sandy loam	CL, SC	A-6, A-7	0	0	100	95-100	90-100	40-85	30-45	10-20
	53-72	Stratified loamy sand to clay loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0	95-100	80-100	80-100	15-85	20-35	5-20
150B:												
Onarga	0-13	Fine sandy loam	SC, SC-SM, SM	A-2, A-4, A-6	0	0	100	100	75-95	25-50	15-28	2-12
	13-29	Loam, sandy loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	98-100	95-100	75-95	30-60	19-32	5-14
	29-60	Stratified sand to sandy loam	SC-SM, SM, SP-SM	A-2, A-4	0	0	95-100	90-100	65-95	5-40	10-20	NP-6
151A:												
Ridgeville	0-25	Fine sandy loam	SC-SM, SM	A-2, A-4	0	0	100	100	75-100	20-50	15-25	2-10
	25-40	Fine sandy loam, loam, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	98-100	95-100	75-95	35-60	20-35	5-15
	40-60	Loamy sand, sandy loam, fine sand	SC, SC-SM, SM, SP-SM	A-2, A-4	0	0	95-100	90-100	65-95	5-45	15-20	NP-8
152A:												
Drummer	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	14-41	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	41-47	Loam, clay loam, sandy loam	CL, SC	A-6, A-7	0	0-5	95-100	90-100	75-95	40-85	30-50	15-30
	47-60	Stratified loamy sand to silty clay loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0-5	95-100	80-98	75-95	15-85	20-35	7-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
153A:												
Pella	0-12	Silty clay loam	CL	A-7	0	0	100	95-100	90-100	85-100	40-50	15-25
	12-33	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	85-100	30-50	15-30
	33-42	Silty clay loam, silt loam, sandy loam	CL, SC	A-6, A-7	0-1	0-5	95-100	85-100	85-95	40-90	25-45	10-25
	42-60	Stratified loamy sand to silty clay loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0-1	0-5	90-100	80-100	50-100	15-85	20-35	7-20
189A:												
Martinton	0-12	Silt loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	75-95	30-45	10-20
	12-39	Silty clay loam, silty clay	CL	A-6, A-7	0	0	95-100	95-100	90-100	70-95	35-50	20-30
	39-60	Stratified sandy loam to silty clay	CL, SC	A-6, A-7	0	0	90-100	80-100	75-100	35-90	25-45	10-25
192A:												
Del Rey	0-4	Silt loam	CL	A-6	0	0	95-100	95-100	90-100	70-95	25-45	10-25
	4-9	Silt loam	CL	A-6	0	0	95-100	95-100	90-100	70-95	20-40	8-20
	9-41	Silty clay loam, silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	85-95	40-55	20-30
	41-60	Silt loam, silty clay loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	70-95	30-45	10-25
221C2:												
Parr	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	80-100	65-95	20-30	4-15
	8-34	Clay loam, loam, silty clay loam	CL	A-6	0	0	95-100	90-100	75-100	50-90	25-45	10-25
	34-60	Loam	CL, CL-ML	A-4	0	0-3	85-100	80-98	70-85	50-65	5-25	3-10
221C3:												
Parr	0-8	Clay loam	CL	A-6	0	0	95-100	90-100	75-100	60-80	25-40	10-20
	8-37	Clay loam, loam	CL	A-6	0	0	95-100	90-100	75-95	50-80	25-45	10-25
	37-60	Loam	CL, CL-ML	A-4	0	0-3	85-100	80-98	70-85	50-65	5-25	3-10

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
223B2:												
Varna	0-12	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	12-39	Silty clay, silty clay loam, clay	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	75-95	35-56	15-29
	39-60	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	70-95	30-45	13-26
223C2:												
Varna	0-9	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	9-40	Silty clay, silty clay loam, clay	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	75-95	35-56	15-29
	40-60	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	70-95	30-45	13-26
230A:												
Rowe	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	98-100	90-100	85-100	35-50	15-30
	14-48	Silty clay, clay	CH	A-7	0	0-2	98-100	95-100	90-100	85-100	50-70	30-45
	48-63	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	90-100	90-100	85-100	45-60	20-35
232A:												
Ashkum	0-12	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	75-100	40-55	20-30
	12-29	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	90-100	85-100	75-100	45-65	20-35
	29-60	Silty clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	75-95	35-50	15-30
235A:												
Bryce	0-13	Silty clay	CH, CL	A-7	0	0	100	100	95-100	85-95	45-60	20-30
	13-45	Silty clay, clay	CH	A-7	0-1	0-5	95-100	95-100	95-100	75-95	50-60	25-35
	45-66	Silty clay, silty clay loam, clay	CH, CL	A-7	0-1	0-5	95-100	90-100	90-100	75-95	40-65	20-40
238A:												
Rantoul	0-17	Silty clay	CH, CL	A-7	0	0	100	98-100	90-100	90-100	40-60	18-30
	17-40	Silty clay, clay	CH, CL, MH, ML	A-7	0	0	98-100	95-100	90-100	85-100	45-70	20-35
	40-60	Silty clay loam, silty clay, clay	CH, CL, MH, ML	A-6, A-7	0	0-2	95-100	90-100	90-100	85-100	35-75	18-40

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
241C3:												
Chatsworth------	0-5	Silty clay	CH	A-7	0	0	100	100	95-100	90-100	50-65	25-35
	5-16	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	90-100	45-75	20-45
	16-60	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	100	95-100	90-100	80-95	45-65	20-35
241D3:												
Chatsworth------	0-2	Silty clay	CH	A-7	0	0	100	100	95-100	90-100	50-65	25-35
	2-22	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	90-100	45-75	20-45
	22-60	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	100	95-100	90-100	80-95	45-65	20-35
294B:												
Symerton--------	0-19	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	19-35	Gravelly clay loam, loam, sandy clay loam	CL	A-6, A-7	0-3	0-10	95-100	75-95	75-90	45-90	35-45	15-25
	35-39	Silty clay loam, silt loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-95	75-95	30-45	15-25
	39-60	Silt loam, silty clay loam	CL	A-6, A-7	0-1	0-5	95-100	90-100	85-95	80-95	25-45	15-25
295A:												
Mokena----------	0-15	Silt loam, loam	CL	A-6, A-7	0	0	98-100	95-100	85-100	70-100	30-45	10-20
	15-38	Clay loam, loam, sandy clay loam	CL, SC	A-6, A-7	0	0	95-100	95-100	70-90	45-85	35-50	15-25
	38-42	Silty clay, clay	CH, CL	A-7	0	0-2	95-100	90-100	85-100	80-100	45-55	20-35
	42-80	Silty clay, clay	CH, CL	A-7	0	0-5	90-100	85-100	85-100	80-100	40-55	20-31

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
330A:												
Peotone	0-13	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	90-100	40-65	15-35
	13-50	Silty clay loam, silty clay	CH, CL	A-7	0	0-3	98-100	95-100	90-100	85-100	40-70	15-40
	50-60	Silty clay loam, silt loam, silty clay	CH, CL	A-6, A-7	0	0-5	95-100	95-100	90-100	75-100	30-60	15-30
375A:												
Rutland	0-14	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	14-36	Silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-55	15-35
	36-44	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-50	15-30
	44-52	Silty clay, clay	CH, CL	A-7	0	0	98-100	95-100	90-100	85-100	45-65	25-40
	52-60	Silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	90-100	85-100	40-60	20-35
375B:												
Rutland	0-13	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	13-40	Silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-55	15-35
	40-50	Silty clay, clay	CH, CL	A-7	0	0	98-100	95-100	90-100	85-100	45-65	25-40
	50-60	Silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	90-100	85-100	40-60	20-35
481A:												
Raub	0-18	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	85-100	25-35	5-15
	18-32	Silty clay loam	CL, CH	A-6, A-7	0	0	100	100	95-100	85-100	35-55	20-35
	32-50	Clay loam, loam, silty clay loam	CL	A-6, A-7	0	0	95-100	85-100	85-95	50-85	35-50	15-25
	50-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0-5	85-95	85-95	70-85	40-70	15-30	5-15

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
530B:												
Ozaukee	0-4	Silt loam	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-10	Silt loam	CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-39	Silty clay loam, clay, silty clay	CL, CH	A-7	0-1	0-5	90-98	85-98	85-95	75-95	45-65	25-40
	39-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530D2:												
Ozaukee	0-6	Silt loam	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-28	Silty clay loam, clay, silty clay	CH, CL	A-7	0-1	0-5	90-98	85-98	85-95	75-95	45-65	25-40
	28-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530E2:												
Ozaukee	0-6	Silt loam	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-28	Silty clay loam, clay, silty clay	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	30-65	25-40
	28-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
541B2:												
Graymont	0-8	Silt loam	CL-ML, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	90-100	28-47	6-17
	8-24	Silty clay loam, silt loam	MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	33-58	8-27
	24-35	Silty clay loam, silt loam	CH, CL	A-4, A-6, A-7	0	0-5	90-100	85-99	80-95	80-90	30-55	9-27
	35-60	Silty clay loam, silt loam	CH, CL	A-4, A-6, A-7	0	0-5	90-100	80-98	80-95	80-90	25-50	9-25

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
570C2:												
Martinsville----	0-9	Loam	ML, CL-ML, CL, SC-SM	A-4	0	0	100	85-100	75-100	45-70	15-25	3-8
	9-45	Clay loam, silty clay loam, sandy clay loam	CL, SC	A-4, A-6	0	0	95-100	85-100	70-100	40-90	25-40	7-15
	45-57	Sandy loam, sandy clay loam, silt loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	55-95	35-80	20-30	5-15
	57-80	Stratified sand to silt loam	SM, SC-SM, SC, CL-ML	A-1, A-2-4, A-4	0	0	95-100	85-100	45-95	10-85	15-25	NP-8
614A:												
Chenoa----------	0-12	Silty clay loam	CL, ML	A-6, A-4, A-7	0	0	100	100	95-100	90-100	32-48	8-21
	12-32	Silty clay loam, silty clay	MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	33-58	8-27
	32-36	Silty clay loam, silt loam	CH, CL	A-4, A-7, A-6	0	0-5	90-100	85-99	80-95	80-95	30-53	9-27
	36-60	Silty clay loam, silt loam	CH, CL	A-4, A-7, A-6	0	0-5	90-100	85-98	80-95	80-90	30-53	9-27
687B:												
Penfield--------	0-10	Loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	50-70	25-35	5-15
	10-61	Clay loam, silty clay loam, sandy loam	CL, SC	A-6	0	0	100	95-100	80-95	45-85	20-35	10-20
	61-72	Fine sandy loam, loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	0	100	85-100	60-70	30-55	20-30	5-15
	72-80	Stratified sand to silt loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4	0	0	100	85-100	75-90	10-85	15-30	5-10
802B:												
Orthents, loamy-	0-6	Loam	CL	A-6	0-1	0-5	95-100	85-100	80-95	60-90	20-40	10-20
	6-60	Loam, silt loam, clay loam	CL	A-6	0-1	0-5	95-100	80-100	75-95	60-90	20-40	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
805B:												
Orthents, clayey	0-6	Silty clay	CH	A-7	0	0	98-100	90-100	85-100	80-98	45-60	20-40
	6-60	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	98-100	85-100	80-98	75-95	40-55	25-45
865.												
Pits, gravel												
1103A:												
Houghton	0-12	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
	12-60	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
3107A:												
Sawmill	0-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	17-32	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	32-58	Silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-50	8-30
	58-65	Silty clay loam, clay loam, sandy loam	CL, SC	A-4, A-6, A-7	0	0	100	90-100	75-100	40-95	20-50	8-30
3405A:												
Zook	0-7	Silty clay	CH	A-7	0	0	100	100	95-100	90-100	45-60	25-40
	7-27	Silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	45-65	30-45
	27-53	Silty clay loam, silty clay	CH, CL	A-7, A-6	0	0	100	100	90-100	85-100	35-60	15-35
	53-60	Silty clay loam, silt loam, silty clay	CL, CH	A-6, A-7	0	0	100	100	90-100	85-100	30-55	10-35

Table 19.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
23A:														
Blount	0-7	5-20	53-77	18-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	4	6	48
	7-13	5-20	53-80	15-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	13-26	5-25	27-60	35-48	1.40-1.70	0.06-0.6	0.12-0.19	3.0-5.9	0.2-1.0	.37	.37			
	26-32	10-30	25-63	27-45	1.50-1.70	0.06-0.2	0.12-0.19	3.0-5.9	0.0-0.5	.37	.37			
	32-60	10-30	30-63	27-40	1.70-2.00	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
23B2:														
Blount	0-4	5-20	53-77	18-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	4-16	5-25	27-60	35-48	1.40-1.70	0.06-0.6	0.12-0.19	3.0-5.9	0.2-1.0	.37	.37			
	16-31	10-30	25-63	27-45	1.50-1.70	0.06-0.2	0.12-0.19	3.0-5.9	0.0-0.5	.37	.37			
	31-60	10-30	30-63	27-40	1.70-2.00	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
56B:														
Dana	0-11	0-15	58-82	18-27	1.25-1.50	0.6-2	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	11-32	0-15	50-73	27-35	1.25-1.55	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			
	32-58	20-40	25-53	27-35	1.40-1.70	0.6-2	0.15-0.19	3.0-5.9	0.2-0.5	.32	.32			
	58-80	20-45	25-65	15-30	1.60-1.85	0.2-0.6	0.05-0.10	0.0-2.9	0.0-0.5	.37	.37			
56B2:														
Dana	0-7	0-15	58-82	18-27	1.25-1.50	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	7-34	0-15	50-73	27-35	1.25-1.55	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			
	34-53	20-40	25-53	27-35	1.40-1.70	0.6-2	0.15-0.19	3.0-5.9	0.2-0.5	.32	.32			
	53-60	20-45	25-65	15-30	1.60-1.85	0.2-0.6	0.05-0.10	0.0-2.9	0.0-0.5	.37	.37			
67A:														
Harpster	0-18	0-15	50-73	27-35	1.05-1.25	0.6-2	0.21-0.24	3.0-5.9	4.0-6.0	.24	.24	5	4L	86
	18-36	0-15	50-73	27-35	1.20-1.50	0.6-2	0.18-0.22	3.0-5.9	0.5-2.0	.37	.37			
	36-41	0-30	35-78	22-35	1.25-1.55	0.6-2	0.17-0.22	3.0-5.9	0.5-1.0	.37	.37			
	41-60	5-55	15-80	15-30	1.40-1.60	0.6-6	0.11-0.22	0.0-2.9	0.0-0.5	.32	.32			
69A:														
Milford	0-18	5-25	35-60	35-40	1.30-1.50	0.6-2	0.20-0.23	6.0-8.9	4.0-6.0	.20	.20	5	4	86
	18-50	0-25	33-65	35-42	1.40-1.60	0.2-0.6	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	50-60	0-55	15-82	18-30	1.50-1.70	0.2-0.6	0.20-0.22	3.0-5.9	0.0-1.0	.37	.37			
91A:														
Swygert	0-12	5-15	45-68	27-40	1.25-1.50	0.2-0.6	0.18-0.22	3.0-5.9	3.0-5.0	.20	.20	4	7	38
	12-18	5-15	40-65	30-45	1.30-1.55	0.2-0.6	0.08-0.16	6.0-8.9	1.0-3.0	.32	.32			
	18-51	5-20	30-50	45-50	1.40-1.70	0.06-0.2	0.05-0.12	6.0-8.9	0.5-1.0	.32	.32			
	51-60	5-20	20-57	38-60	1.70-1.90	0.0-0.06	0.03-0.05	6.0-8.9	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
91B2:														
Swygert	0-7	5-15	45-68	27-40	1.25-1.50	0.2-0.6	0.18-0.22	3.0-5.9	2.0-4.0	.20	.20	4	7	38
	7-12	5-15	40-65	30-45	1.30-1.55	0.2-0.6	0.08-0.16	6.0-8.9	1.0-3.0	.32	.32			
	12-48	5-20	30-50	45-50	1.40-1.70	0.06-0.2	0.05-0.12	6.0-8.9	0.5-1.0	.32	.32			
	48-60	5-20	20-57	38-60	1.70-1.90	0.0-0.06	0.03-0.05	6.0-8.9	0.0-0.5	.37	.37			
102A:														
La Hogue	0-16	25-45	28-65	10-27	1.40-1.60	0.6-2	0.20-0.24	0.0-2.9	3.0-4.0	.24	.24	5	5	56
	16-43	15-60	5-67	18-35	1.50-1.70	0.6-2	0.12-0.20	3.0-5.9	0.5-2.0	.32	.32			
	43-80	15-80	0-80	5-25	1.55-1.75	0.6-6	0.08-0.20	0.0-2.9	0.5-1.0	.28	.28			
125A:														
Selma	0-6	20-45	28-60	20-27	1.40-1.60	0.6-2	0.20-0.24	0.0-2.9	4.0-6.0	.24	.24	5	6	48
	6-13	20-45	20-53	27-35	1.40-1.60	0.6-2	0.17-0.19	3.0-5.9	3.0-5.0	.17	.17			
	13-44	15-62	6-67	18-32	1.40-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	44-80	30-90	0-63	7-18	1.60-1.90	2-6	0.07-0.19	0.0-2.9	0.0-1.0	.28	.28			
134A:														
Camden	0-8	0-10	63-86	14-27	1.35-1.55	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	8-13	0-10	65-88	12-25	1.35-1.55	0.6-2	0.20-0.22	0.0-2.9	0.1-1.0	.49	.49			
	13-38	0-10	55-78	22-35	1.40-1.60	0.6-2	0.14-0.24	3.0-5.9	0.1-0.5	.37	.37			
	38-56	15-65	5-67	18-30	1.45-1.65	0.6-2	0.11-0.22	3.0-5.9	0.0-0.5	.32	.32			
	56-60	15-80	0-80	5-25	1.40-1.70	0.6-6	0.08-0.20	0.0-2.9	0.0-0.5	.28	.28			
146A:														
Elliott	0-6	0-15	55-76	24-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	4	6	48
	6-11	0-15	50-73	27-35	1.15-1.35	0.6-2	0.21-0.23	3.0-5.9	3.0-4.0	.20	.20			
	11-41	4-25	25-61	35-50	1.30-1.60	0.2-0.6	0.11-0.20	3.0-5.9	0.0-2.0	.37	.37			
	41-60	5-30	30-68	27-40	1.70-1.90	0.06-0.2	0.07-0.10	3.0-5.9	0.0-0.5	.43	.43			
146B2:														
Elliott	0-8	0-15	50-73	27-35	1.15-1.35	0.6-2	0.21-0.23	3.0-5.9	3.0-4.0	.20	.20	4	7	38
	8-27	4-25	25-61	35-50	1.30-1.60	0.2-0.6	0.11-0.20	3.0-5.9	0.0-2.0	.37	.37			
	27-60	5-30	30-68	27-40	1.70-1.90	0.06-0.2	0.07-0.10	3.0-5.9	0.0-0.5	.43	.43			
147A:														
Clarence	0-11	1-15	45-72	27-40	1.20-1.45	0.2-0.6	0.16-0.20	3.0-5.9	3.0-5.0	.20	.20	3	7	38
	11-39	1-15	25-49	50-60	1.40-1.60	0.0-0.06	0.07-0.09	3.0-5.9	0.0-1.0	.32	.32			
	39-60	1-15	25-59	40-60	1.65-1.85	0.0-0.06	0.03-0.07	3.0-5.9	0.0-0.5	.37	.37			
147B2:														
Clarence	0-8	1-15	45-72	27-40	1.20-1.45	0.2-0.6	0.16-0.20	3.0-5.9	2.0-4.0	.20	.20	3	7	38
	8-35	1-15	25-49	50-60	1.40-1.60	0.0-0.06	0.07-0.09	3.0-5.9	0.0-1.0	.32	.32			
	35-60	1-15	25-59	40-60	1.65-1.85	0.0-0.06	0.03-0.07	3.0-5.9	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
148B:														
Proctor	0-11	0-10	63-82	18-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	3.0-4.0	.28	.28	5	6	48
	11-28	0-10	55-75	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	28-33	15-70	0-67	18-32	1.30-1.55	0.6-2	0.13-0.16	3.0-5.9	0.2-1.0	.32	.32			
	33-60	15-85	0-80	5-20	1.40-1.70	0.6-6	0.07-0.19	0.0-2.9	0.2-0.5	.28	.28			
148B2:														
Proctor	0-11	0-10	63-82	18-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	11-26	0-10	55-75	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	26-40	10-75	0-72	18-32	1.30-1.55	0.6-2	0.13-0.16	3.0-5.9	0.2-1.0	.32	.32			
	40-60	15-80	0-80	5-20	1.40-1.70	0.6-6	0.07-0.19	0.0-2.9	0.2-0.5	.28	.28			
149A:														
Brenton	0-16	0-15	58-80	20-27	1.25-1.45	0.6-2	0.22-0.26	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	16-35	0-15	50-75	25-35	1.30-1.55	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.37	.37			
	35-53	15-60	10-67	18-30	1.40-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-0.5	.32	.32			
	53-72	15-80	0-80	5-30	1.50-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.28	.28			
150B:														
Onarga	0-13	50-75	10-42	8-15	1.30-1.65	0.6-6	0.13-0.22	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	13-29	45-75	7-43	12-18	1.45-1.70	0.6-6	0.15-0.19	0.0-2.9	0.2-1.0	.24	.24			
	29-60	65-95	0-33	2-10	1.65-1.90	6-20	0.05-0.13	0.0-2.9	0.0-0.5	.15	.15			
151A:														
Ridgeville	0-25	50-80	10-38	10-15	1.30-1.65	0.6-6	0.15-0.18	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	25-40	45-70	12-43	12-18	1.45-1.70	0.6-6	0.15-0.19	0.0-2.9	0.2-1.0	.24	.24			
	40-60	60-95	0-37	3-10	1.55-1.90	6-20	0.05-0.13	0.0-2.9	0.0-0.5	.15	.15			
152A:														
Drummer	0-14	0-15	50-73	27-35	1.10-1.30	0.6-2	0.21-0.23	3.0-5.9	4.0-7.0	.24	.24	5	7	38
	14-41	0-15	50-80	20-35	1.20-1.45	0.6-2	0.21-0.24	3.0-5.9	0.5-2.0	.37	.37			
	41-47	15-55	12-70	15-33	1.30-1.55	0.6-2	0.17-0.20	3.0-5.9	0.2-0.5	.32	.32			
	47-60	15-80	0-75	10-32	1.40-1.70	0.6-6	0.11-0.19	0.0-2.9	0.0-0.2	.28	.28			
153A:														
Pella	0-12	0-15	50-73	27-35	1.10-1.30	0.6-2	0.21-0.23	3.0-5.9	5.0-6.0	.24	.24	5	7	38
	12-33	0-15	50-73	27-35	1.20-1.45	0.6-2	0.21-0.24	3.0-5.9	0.5-1.0	.37	.37			
	33-42	10-55	15-75	15-30	1.35-1.60	0.6-2	0.15-0.20	3.0-5.9	0.2-0.5	.32	.32			
	42-60	15-80	0-75	10-30	1.40-1.70	0.6-6	0.10-0.22	0.0-2.9	0.0-0.2	.28	.28			
189A:														
Martinton	0-12	5-25	50-70	20-27	1.20-1.40	0.6-2	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	5	6	48
	12-39	5-25	30-60	35-45	1.25-1.45	0.2-0.6	0.11-0.20	3.0-5.9	0.5-2.0	.37	.37			
	39-60	10-65	5-75	15-42	1.40-1.60	0.2-0.6	0.11-0.22	3.0-5.9	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
192A:														
Del Rey	0-4	5-30	43-80	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	5	6	48
	4-9	5-30	45-80	15-25	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	9-41	5-20	35-60	35-45	1.40-1.65	0.06-0.2	0.12-0.20	3.0-5.9	0.0-1.0	.37	.37			
	41-60	5-30	37-73	22-33	1.50-1.70	0.06-0.2	0.09-0.11	3.0-5.9	0.0-0.5	.43	.43			
221C2:														
Parr	0-8	5-35	50-80	12-25	1.30-1.45	0.6-2	0.20-0.24	0.0-2.9	2.0-3.0	.24	.24	5	5	56
	8-34	10-50	20-65	22-35	1.40-1.55	0.6-2	0.15-0.19	3.0-5.9	0.2-0.5	.32	.32			
	34-60	35-50	30-50	10-20	1.70-1.90	0.2-0.6	0.05-0.10	0.0-2.9	0.0-0.2	.37	.37			
221C3:														
Parr	0-8	20-40	25-53	27-35	1.40-1.60	0.6-2	0.17-0.19	3.0-5.9	0.5-2.0	.32	.32	4	6	48
	8-37	20-50	15-53	22-35	1.40-1.55	0.6-2	0.15-0.19	3.0-5.9	0.2-0.5	.32	.32			
	37-60	35-50	30-50	10-20	1.70-1.90	0.2-0.6	0.05-0.10	0.0-2.9	0.0-0.2	.37	.37			
223B2:														
Varna	0-12	5-20	53-75	20-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.28	.28	4	6	48
	12-39	5-20	30-60	35-50	1.30-1.60	0.2-0.6	0.09-0.19	3.0-5.9	0.5-1.0	.37	.37			
	39-60	5-20	40-68	27-40	1.65-1.90	0.06-0.2	0.05-0.10	3.0-5.9	0.2-0.5	.43	.43			
223C2:														
Varna	0-9	5-20	53-75	20-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.28	.28	4	6	48
	9-40	5-20	30-60	35-50	1.30-1.60	0.2-0.6	0.09-0.19	3.0-5.9	0.5-1.0	.37	.37			
	40-60	5-22	40-68	27-40	1.65-1.90	0.06-0.2	0.05-0.10	3.0-5.9	0.2-0.5	.43	.43			
230A:														
Rowe	0-14	0-15	45-70	30-40	1.30-1.55	0.06-0.2	0.16-0.20	3.0-5.9	3.0-5.0	.20	.20	5	4	86
	14-48	0-15	25-52	48-60	1.30-1.60	0.0-0.06	0.09-0.13	6.0-8.9	0.2-2.0	.32	.32			
	48-63	0-15	35-60	40-50	1.45-1.75	0.0-0.06	0.03-0.07	6.0-8.9	0.0-1.0	.37	.37			
232A:														
Ashkum	0-12	0-20	40-65	35-40	1.15-1.35	0.2-0.6	0.15-0.20	6.0-8.9	3.0-7.0	.20	.20	5	4	86
	12-29	0-20	35-65	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.0-8.9	0.5-2.0	.32	.32			
	29-60	5-15	45-65	30-40	1.45-1.75	0.2-0.6	0.09-0.18	3.0-5.9	0.0-0.5	.43	.43			
235A:														
Bryce	0-13	5-15	37-55	40-48	1.30-1.50	0.2-0.6	0.12-0.16	6.0-8.9	5.0-7.0	.17	.17	5	4	86
	13-45	5-20	28-53	42-52	1.35-1.60	0.06-0.2	0.09-0.13	6.0-8.9	0.0-1.0	.32	.32			
	45-66	5-20	20-57	38-60	1.60-1.75	0.0-0.06	0.03-0.05	6.0-8.9	0.0-0.5	.37	.37			
238A:														
Rantoul	0-17	0-10	40-60	40-50	1.35-1.55	0.2-0.6	0.12-0.23	6.0-8.9	4.0-7.0	.24	.24	5	4	86
	17-40	0-15	25-58	42-60	1.45-1.65	0.0-0.06	0.09-0.13	6.0-8.9	0.5-3.0	.28	.28			
	40-60	0-20	25-65	35-55	1.50-1.70	0.0-0.06	0.08-0.18	6.0-8.9	0.0-1.0	.28	.28			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
241C3:														
Chatsworth----------	0-5	0-10	30-60	40-60	1.35-1.60	0.0-0.06	0.09-0.18	3.0-5.9	0.5-1.0	.32	.32	2	4	86
	5-16	0-10	30-65	35-60	1.50-1.70	0.0-0.06	0.05-0.07	3.0-5.9	0.0-0.5	.32	.32			
	16-60	5-15	35-60	35-50	1.70-1.90	0.0-0.06	0.03-0.05	3.0-5.9	0.0-0.5	.37	.37			
241D3:														
Chatsworth----------	0-2	0-10	30-60	40-60	1.35-1.60	0.0-0.06	0.09-0.18	3.0-5.9	0.5-1.0	.32	.32	2	4	86
	2-22	0-10	30-65	35-60	1.50-1.70	0.0-0.06	0.05-0.07	3.0-5.9	0.0-0.5	.32	.32			
	22-60	5-15	35-60	35-50	1.70-1.90	0.0-0.06	0.03-0.05	3.0-5.9	0.0-0.5	.37	.37			
294B:														
Symerton----------	0-19	0-15	58-80	20-27	1.15-1.30	0.6-2	0.21-0.24	0.0-2.9	3.0-4.0	.24	.24	5	6	48
	19-35	15-60	5-60	25-35	1.35-1.60	0.6-2	0.12-0.18	3.0-5.9	0.2-1.0	.28	.32			
	35-39	5-25	40-75	20-35	1.40-1.65	0.2-0.6	0.10-0.18	3.0-5.9	0.2-0.5	.37	.37			
	39-60	5-20	45-75	20-35	1.45-1.75	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
295A:														
Mokena----------	0-15	0-30	43-80	20-27	1.15-1.35	0.6-2	0.20-0.24	0.0-2.9	3.0-5.0	.24	.24	4	6	48
	15-38	15-55	10-55	23-35	1.35-1.55	0.2-0.6	0.15-0.20	3.0-5.9	0.2-2.0	.32	.32			
	38-42	1-20	20-59	40-60	1.40-1.70	0.06-0.2	0.05-0.12	6.0-8.9	0.0-0.5	.32	.32			
	42-80	1-20	20-59	40-60	1.65-1.85	0.0-0.06	0.03-0.07	6.0-8.9	0.0-0.5	.37	.37			
330A:														
Peotone----------	0-13	0-10	50-67	33-40	1.20-1.40	0.2-0.6	0.21-0.23	6.0-8.9	5.0-7.0	.24	.24	5	4	86
	13-50	0-10	45-65	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.0-8.9	0.5-3.0	.37	.37			
	50-60	0-20	38-75	25-42	1.40-1.65	0.2-0.6	0.18-0.20	6.0-8.9	0.2-0.5	.43	.43			
375A:														
Rutland----------	0-14	0-10	55-73	27-35	1.20-1.40	0.6-2	0.22-0.24	3.0-5.9	3.0-5.0	.28	.28	4	7	38
	14-36	0-10	45-65	35-45	1.30-1.55	0.2-0.6	0.18-0.20	6.0-8.9	0.2-2.0	.37	.37			
	36-44	0-15	50-80	20-35	1.35-1.55	0.2-0.6	0.18-0.22	3.0-5.9	0.2-1.0	.37	.37			
	44-52	1-15	25-59	40-60	1.45-1.70	0.06-0.6	0.05-0.12	6.0-8.9	0.0-0.5	.32	.32			
	52-60	1-15	20-59	40-65	1.65-1.85	0.0-0.06	0.03-0.07	6.0-8.9	0.0-0.5	.37	.37			
375B:														
Rutland----------	0-13	0-10	55-73	27-35	1.20-1.40	0.6-2	0.22-0.24	3.0-5.9	3.0-5.0	.28	.28	4	7	38
	13-40	0-10	45-65	35-45	1.30-1.55	0.2-0.6	0.18-0.20	6.0-8.9	0.2-2.0	.37	.37			
	40-50	1-15	25-59	40-60	1.45-1.70	0.06-0.6	0.05-0.12	6.0-8.9	0.0-0.5	.32	.32			
	50-60	1-15	20-59	40-65	1.65-1.85	0.0-0.06	0.03-0.07	6.0-8.9	0.0-0.5	.37	.37			
481A:														
Raub----------	0-18	0-15	58-80	20-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	18-32	0-15	50-73	27-35	1.50-1.70	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.37	.37			
	32-50	15-35	30-61	24-35	1.50-1.70	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.32	.32			
	50-60	25-50	18-55	20-32	1.60-1.85	0.2-0.6	0.05-0.10	0.0-2.9	0.0-0.5	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
530B:														
Ozaukee	0-4	5-15	58-80	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-10	5-15	58-80	15-27	1.35-1.55	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	10-39	5-15	35-60	35-50	1.60-1.70	0.06-0.2	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37			
	39-60	5-23	42-68	27-35	1.70-1.90	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
530D2:														
Ozaukee	0-6	5-15	58-80	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	6-28	5-15	35-60	35-50	1.60-1.70	0.06-0.2	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37			
	28-60	5-23	42-68	27-35	1.70-1.90	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
530E2:														
Ozaukee	0-6	5-15	58-80	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	6-28	5-15	35-60	35-50	1.60-1.70	0.06-0.2	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37			
	28-60	5-23	42-68	27-35	1.70-1.90	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
541B2:														
Graymont	0-8	0-10	63-78	22-27	1.10-1.30	0.6-2	0.22-0.24	0.0-2.9	3.0-4.0	.28	.28	5	6	48
	8-24	0-10	55-75	25-35	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-2.0	.37	.37			
	24-35	10-20	40-68	22-40	1.50-1.75	0.06-0.2	0.14-0.18	3.0-5.9	0.0-0.5	.37	.37			
	35-60	10-20	46-66	24-34	1.50-1.75	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
570C2:														
Martinsville	0-9	30-50	30-58	12-20	1.35-1.45	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	9-45	12-50	17-68	20-33	1.40-1.60	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			
	45-57	20-60	15-65	15-25	1.40-1.60	0.6-2	0.12-0.17	0.0-2.9	0.0-0.2	.32	.32			
	57-80	15-90	0-80	5-20	1.50-1.70	0.6-6	0.08-0.17	0.0-2.9	0.0-0.2	.28	.28			
614A:														
Chenoa	0-12	0-10	58-73	27-32	1.10-1.30	0.6-2	0.21-0.23	3.0-5.9	4.0-5.0	.28	.28	5	7	38
	12-32	0-10	45-68	32-45	1.25-1.45	0.6-2	0.16-0.20	3.0-5.9	0.0-2.0	.37	.37			
	32-36	5-20	40-70	25-40	1.50-1.75	0.06-0.2	0.14-0.20	3.0-5.9	0.0-0.5	.37	.37			
	36-60	10-20	40-66	24-40	1.50-1.75	0.06-0.2	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43			
687B:														
Penfield	0-10	30-50	28-60	10-22	1.30-1.45	0.6-2	0.20-0.24	0.0-2.9	3.0-5.0	.24	.24	5	5	56
	10-61	15-55	13-67	18-32	1.40-1.60	0.6-2	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32			
	61-72	45-65	5-43	12-30	1.40-1.60	0.6-2	0.14-0.16	0.0-2.9	0.0-0.5	.28	.28			
	72-80	15-90	0-80	5-20	1.50-1.70	0.6-6	0.10-0.21	0.0-2.9	0.0-0.5	.24	.24			
802B:														
Orthents, loamy	0-6	23-52	28-50	22-27	1.70-1.75	0.2-0.6	0.18-0.22	3.0-5.9	0.5-2.0	.43	.43	5	6	48
	6-60	20-52	25-58	22-30	1.70-1.80	0.2-0.6	0.16-0.20	3.0-5.9	0.2-1.0	.43	.43			
805B:														
Orthents, clayey	0-6	5-20	35-55	40-60	1.50-1.65	0.0-0.06	0.08-0.14	6.0-9.0	0.5-2.0	.43	.43	5	4	86
	6-60	5-30	15-60	35-60	1.60-1.90	0.0-0.06	0.03-0.10	6.0-9.0	0.2-1.0	.43	.43			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
865. Pits, gravel														
1103A:														
Houghton	0-12	0-0	0-0	0-0	0.20-0.35	0.2-6	0.35-0.45	---	70-99	---	---	3	2	134
	12-60	0-0	0-0	0-0	0.15-0.25	0.2-6	0.35-0.45	---	70-99	---	---			
3107A:														
Sawmill	0-17	0-15	50-73	27-35	1.20-1.40	0.6-2	0.21-0.23	3.0-5.9	4.0-5.0	.28	.28	5	7	38
	17-32	0-15	50-73	27-35	1.20-1.40	0.6-2	0.21-0.23	3.0-5.9	1.0-4.0	.28	.28			
	32-58	5-20	45-68	27-35	1.30-1.45	0.6-2	0.17-0.20	3.0-5.9	0.2-2.0	.32	.32			
	58-65	5-55	10-77	18-35	1.35-1.50	0.6-2	0.15-0.19	3.0-5.9	0.2-1.0	.32	.32			
3405A:														
Zook	0-7	0-10	45-60	40-45	1.30-1.40	0.06-0.2	0.12-0.16	6.0-8.9	5.0-7.0	.24	.24	5	4	86
	7-27	0-10	45-65	35-45	1.30-1.45	0.06-0.2	0.11-0.18	6.0-8.9	3.0-6.0	.24	.24			
	27-53	0-15	40-73	27-45	1.35-1.50	0.06-0.2	0.11-0.19	6.0-8.9	1.0-4.0	.28	.28			
	53-60	0-15	43-80	20-42	1.35-1.55	0.06-0.2	0.10-0.22	3.0-5.9	0.5-3.0	.32	.32			

Table 20.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
23A:				
Blount	0-7	15-22	5.1-7.3	0
	7-13	9.0-18	5.1-7.3	0
	13-26	21-31	4.5-6.5	0
	26-32	16-30	6.1-7.8	0-25
	32-60	16-25	7.4-8.4	22-35
23B2:				
Blount	0-4	13-20	5.1-7.3	0
	4-16	21-31	4.5-6.5	0
	16-31	16-28	6.1-7.8	0-25
	31-60	16-25	7.4-8.4	22-35
56B:				
Dana	0-11	17-26	5.6-7.3	0
	11-32	17-23	5.1-7.3	0
	32-58	17-22	5.6-7.8	0-5
	58-80	9.0-19	7.4-8.4	15-25
56B2:				
Dana	0-7	15-24	5.6-7.3	0
	7-34	17-23	5.1-7.3	0
	34-53	17-22	5.6-7.8	0-5
	53-60	9.0-19	7.4-8.4	15-25
67A:				
Harpster	0-18	24-33	7.4-8.4	10-40
	18-36	17-25	7.4-8.4	5-40
	36-41	14-23	7.4-8.4	5-40
	41-60	9.0-19	7.4-8.4	10-40
69A:				
Milford	0-18	26-36	5.6-7.3	0
	18-50	22-29	5.6-7.8	0-10
	50-60	4.0-18	6.6-8.4	0-30
91A:				
Swygert	0-12	22-34	5.6-7.3	0
	12-18	20-33	5.6-7.3	0
	18-51	28-32	6.6-8.4	0-20
	51-60	23-37	7.4-8.4	15-30
91B2:				
Swygert	0-7	20-32	5.6-7.3	0
	7-12	20-33	5.6-7.3	0
	12-48	28-32	6.6-8.4	0-20
	48-60	23-37	7.4-8.4	15-30
102A:				
La Hogue	0-16	12-24	5.6-7.8	0
	16-43	12-25	5.1-7.8	0
	43-80	4.0-17	6.1-7.8	0-20
125A:				
Selma	0-6	20-28	6.1-7.8	0
	6-13	22-31	6.1-7.8	0
	13-44	11-23	6.1-8.4	0-20
	44-80	7.0-20	6.6-8.4	0-20

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
134A:				
Camden	0-8	10-22	5.1-7.3	0
	8-13	7.0-17	5.1-7.3	0
	13-38	13-22	5.1-7.3	0
	38-56	11-19	5.1-7.3	0
	56-60	3.0-16	5.1-8.4	0-5
146A:				
Elliott	0-6	22-26	5.6-7.3	0
	6-11	22-29	5.6-7.3	0
	11-41	21-34	5.6-7.8	0-5
	41-60	16-25	7.4-8.4	10-40
146B2:				
Elliott	0-8	22-29	5.6-7.3	0
	8-27	21-34	5.6-7.8	0-5
	27-60	16-25	7.4-8.4	10-40
147A:				
Clarence	0-11	19-30	5.6-7.3	0
	11-39	25-32	5.6-8.4	0-20
	39-60	20-31	7.4-8.4	5-30
147B2:				
Clarence	0-8	17-28	5.6-7.3	0
	8-35	25-32	5.6-8.4	0-20
	35-60	20-31	7.4-8.4	5-30
148B:				
Proctor	0-11	17-24	5.1-7.8	0
	11-28	16-25	5.6-7.3	0
	28-33	11-21	5.6-7.3	0
	33-60	3.0-13	5.6-7.8	0-10
148B2:				
Proctor	0-11	15-24	5.1-7.8	0
	11-26	16-25	5.6-7.3	0
	26-40	11-21	5.6-7.3	0
	40-60	3.0-13	5.6-7.8	0-10
149A:				
Brenton	0-16	18-26	5.6-7.8	0
	16-35	15-23	5.6-7.3	0
	35-53	12-19	5.6-7.8	0-5
	53-72	3.0-19	5.6-8.4	0-20
150B:				
Onarga	0-13	8.0-17	5.1-7.3	0
	13-29	7.0-13	4.5-7.3	0
	29-60	1.0-7.0	5.6-7.3	0
151A:				
Ridgeville	0-25	10-17	5.6-7.3	0
	25-40	7.0-13	5.6-7.3	0
	40-60	2.0-7.0	6.1-7.3	0
152A:				
Drummer	0-14	24-35	5.6-7.8	0
	14-41	13-25	5.6-7.8	0
	41-47	9.0-21	6.1-8.4	0-20
	47-60	6.0-20	6.6-8.4	0-40

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
153A:				
Pella	0-12	26-33	6.1-7.8	0
	12-33	17-23	6.6-7.8	0-10
	33-42	9.0-19	7.4-8.4	5-30
	42-60	6.0-18	7.4-8.4	5-40
189A:				
Martinton	0-12	18-24	5.6-7.3	0
	12-39	18-24	5.6-7.8	0-10
	39-60	7.0-22	6.1-8.4	5-30
192A:				
Del Rey	0-4	12-20	4.5-7.3	0
	4-9	10-18	4.5-7.3	0
	9-41	18-24	4.5-8.4	0-10
	41-60	12-18	7.9-8.4	5-40
221C2:				
Parr	0-8	10-19	5.6-7.3	0
	8-34	11-19	5.6-7.3	0
	34-60	5.0-11	7.4-8.4	5-35
221C3:				
Parr	0-8	14-20	5.6-7.3	0
	8-37	11-19	5.6-7.3	0
	37-60	5.0-11	7.4-8.4	5-35
223B2:				
Varna	0-12	16-22	5.6-7.8	0
	12-39	22-32	5.6-7.8	0-15
	39-60	17-25	6.6-8.4	5-30
223C2:				
Varna	0-9	16-22	5.6-7.8	0
	9-40	22-32	5.6-7.8	0-15
	40-60	17-25	6.6-8.4	5-30
230A:				
Rowe	0-14	24-34	5.1-7.8	0
	14-48	29-40	6.1-8.4	0-20
	48-63	24-32	7.4-8.4	5-25
232A:				
Ashkum	0-12	27-38	5.6-7.8	0
	12-29	22-31	6.1-7.8	0-5
	29-60	18-25	6.1-8.4	0-25
235A:				
Bryce	0-13	34-43	5.6-7.8	0
	13-45	25-33	6.6-8.4	0-20
	45-66	23-37	7.4-8.4	5-25
238A:				
Rantoul	0-17	32-44	6.1-7.3	0
	17-40	26-42	6.1-8.4	0-15
	40-60	21-35	7.4-8.4	5-25
241C3:				
Chatsworth	0-5	25-38	5.6-8.4	0-20
	5-16	21-37	6.1-8.4	0-25
	16-60	21-30	7.4-8.4	5-30

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
241D3:				
Chatsworth	0-2	25-38	5.6-8.4	0-20
	2-22	21-37	6.1-8.4	0-25
	22-60	21-30	7.4-8.4	5-30
294B:				
Symerton	0-19	18-24	5.6-7.3	0
	19-35	16-23	5.6-7.8	0
	35-39	13-22	6.6-8.4	0-15
	39-60	12-22	7.4-8.4	5-30
295A:				
Mokena	0-15	18-27	6.1-7.8	0
	15-38	14-25	6.1-7.8	0
	38-42	22-34	6.6-7.8	0-15
	42-80	20-31	7.4-8.4	5-30
330A:				
Peotone	0-13	30-38	5.6-7.8	0
	13-50	22-33	6.1-7.8	0
	50-60	15-26	6.6-8.4	0-15
375A:				
Rutland	0-14	22-28	5.1-7.3	0
	14-36	21-31	5.1-7.8	0-5
	36-44	12-22	6.1-7.8	0-10
	44-52	22-32	6.6-8.4	0-15
	52-60	20-34	7.4-8.4	5-30
375B:				
Rutland	0-13	22-28	5.1-7.3	0
	13-40	21-31	5.1-7.8	0-5
	40-50	22-32	6.6-8.4	0-15
	50-60	20-34	7.4-8.4	5-30
481A:				
Raub	0-18	16-24	5.6-7.3	0
	18-32	18-25	5.1-6.5	0
	32-50	16-23	6.1-7.8	0-5
	50-60	12-20	7.4-8.4	10-35
530B:				
Ozaukee	0-4	11-22	6.1-7.3	0
	4-10	9.0-18	5.6-7.3	0
	10-39	21-31	6.1-8.4	0-20
	39-60	16-22	7.9-8.4	10-40
530D2:				
Ozaukee	0-6	11-20	6.1-7.3	0
	6-28	21-31	6.1-8.4	0-20
	28-60	16-22	7.9-8.4	10-40
530E2:				
Ozaukee	0-6	11-20	6.1-7.3	0
	6-28	21-31	6.1-8.4	0-20
	28-60	16-22	7.9-8.4	10-40
541B2:				
Graymont	0-8	19-24	6.1-7.3	0
	8-24	15-25	5.6-7.3	0
	24-35	13-25	6.6-7.8	0-10
	35-60	14-22	7.4-8.4	5-30

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
570C2:				
Martinsville	0-9	8.0-14	5.1-7.3	0
	9-45	10-18	5.1-7.3	0
	45-57	8.0-13	5.1-7.8	0
	57-80	3.0-10	6.1-8.4	0-45
614A:				
Chenoa	0-12	24-29	5.6-7.3	0
	12-32	19-29	5.6-7.3	0
	32-36	15-25	6.1-7.8	0-10
	36-60	14-25	7.4-8.4	5-40
687B:				
Penfield	0-10	12-23	5.1-7.3	0
	10-61	12-21	5.1-7.3	0
	61-72	7.0-19	5.6-7.8	0-5
	72-80	3.0-13	6.6-8.4	0-25
802B:				
Orthents, loamy	0-6	10-25	5.6-7.8	0-10
	6-60	10-20	5.6-8.4	0-20
805B:				
Orthents, clayey	0-6	22-38	5.6-7.8	0-10
	6-60	15-35	6.1-8.4	0-25
865.				
Pits, gravel				
1103A:				
Houghton	0-12	140-200	4.5-7.8	0
	12-60	100-200	4.5-7.8	0
3107A:				
Sawmill	0-17	24-31	6.1-7.8	0
	17-32	18-29	6.1-7.8	0
	32-58	17-25	6.1-7.8	0-10
	58-65	11-23	6.1-8.4	0-30
3405A:				
Zook	0-7	34-41	5.6-7.3	0
	7-27	27-41	5.6-7.3	0
	27-53	18-35	6.1-7.8	0
	53-60	13-32	6.1-8.4	0-10

Table 21.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
23A:										
Blount	C									
		January	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		February	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		March	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		April	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		May	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
23B2:										
Blount	C									
		January	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		February	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		March	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		April	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		May	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
56B:										
Dana	B									
		February	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
56B2:										
Dana	B									
		February	2.0-3.5	3.3-5.5	Perched	---	---	None	---	None
		March	2.0-3.5	3.3-5.5	Perched	---	---	None	---	None
		April	2.0-3.5	3.3-5.5	Perched	---	---	None	---	None
67A:										
Harpster	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
69A:										
Milford	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
91A:										
Swygert	C									
		January	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
91B2:										
Swygert	C									
		January	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-5.0	Perched	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
102A:										
La Hogue	B									
		January	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		February	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		March	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		April	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
125A:										
Selma	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
134A:										
Camden	B									
		Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
146A:										
Elliott	C									
		January	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
146B2:										
Elliott	C									
		January	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-4.5	Perched	---	---	None	---	None
147A:										
Clarence	D									
		January	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
147B2:										
Clarence	D									
		January	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
148B:										
Proctor	B									
		Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
148B2:										
Proctor	B									
		Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
149A:										
Brenton	B									
		January	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		February	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		March	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		April	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
150B:										
Onarga	B									
		Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
151A:										
Ridgeville	B									
		January	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		February	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		March	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		April	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
152A:										
Drummer	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
153A:										
Pella	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
189A:										
Martinton	C									
		January	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		February	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		March	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		April	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
192A:										
Del Rey	C									
		January	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		February	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		March	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		April	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		May	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
221C2:										
Parr	B									
		February	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None
221C3:										
Parr	B									
		February	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
223B2:										
Varna	C									
		February	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
223C2:										
Varna	C									
		February	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-5.5	Perched	---	---	None	---	None
230A:										
Rowe	D									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
232A:										
Ashkum	C									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
235A:										
Bryce	D									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
238A:										
Rantoul	D									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		June	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
241C3:										
Chatsworth	D									
		February	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
241D3:										
Chatsworth	D									
		February	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
294B:										
Symerton	B									
		February	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
295A:										
Mokena	C									
		January	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
330A:										
Peotone	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		June	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
375A:										
Rutland	C									
		January	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
375B:										
Rutland	C									
		January	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-5.5	Perched	---	---	None	---	None
481A:										
Raub	C									
		January	1.0-2.0	3.5-6.6	Perched	---	---	None	---	None
		February	1.0-2.0	3.5-6.6	Perched	---	---	None	---	None
		March	1.0-2.0	3.5-6.6	Perched	---	---	None	---	None
		April	1.0-2.0	3.5-6.6	Perched	---	---	None	---	None
		May	1.0-2.0	3.5-6.6	Perched	---	---	None	---	None
530B:										
Ozaukee	C									
		February	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
530D2:										
Ozaukee	C									
		February	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
530E2:										
Ozaukee	C									
		February	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-4.5	Perched	---	---	None	---	None
541B2:										
Graymont	B									
		February	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-4.0	Perched	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
570C2:										
Martinsville----	B									
		Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
614A:										
Chenoa----------	B									
		January	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		February	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		March	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		April	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
		May	1.0-2.0	2.0-4.0	Perched	---	---	None	---	None
687B:										
Penfield--------	B									
		February	3.5-6.0	>6.0	Apparent	---	---	None	---	None
		March	3.5-6.0	>6.0	Apparent	---	---	None	---	None
		April	3.5-6.0	>6.0	Apparent	---	---	None	---	None
802B:										
Orthents, loamy-	B									
		February	3.5-5.0	5.0-6.0	Perched	---	---	None	---	None
		March	3.5-5.0	5.0-6.0	Perched	---	---	None	---	None
		April	3.5-5.0	5.0-6.0	Perched	---	---	None	---	None
805B:										
Orthents, clayey	C									
		February	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		March	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
		April	2.0-3.5	3.5-5.0	Perched	---	---	None	---	None
865.										
Pits, gravel										
1103A:										
Houghton--------	D									
		January	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
		February	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
		March	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
		April	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
		May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		June	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		July	0.0-0.5	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		August	0.0-0.5	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		September	0.0-0.5	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		October	0.0-0.5	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		November	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		December	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
3107A:										
Sawmill---------	B/D									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		June	---	---	---	---	---	None	Brief	Frequent
		November	---	---	---	---	---	None	Brief	Frequent
		December	---	---	---	---	---	None	Brief	Frequent

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
3405A: Zook	C									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		June	---	---	---	---	---	None	Brief	Frequent
		November	---	---	---	---	---	None	Brief	Frequent
		December	---	---	---	---	---	None	Brief	Frequent

Table 22.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer		Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Initial	Total		Uncoated steel	Concrete
		In	In	In			
23A:							
Blount	Dense material	30-48	0	---	High	High	High
23B2:							
Blount	Dense material	30-48	0	---	High	High	High
56B:							
Dana	---	---	0	---	High	High	Moderate
56B2:							
Dana	---	---	0	---	High	High	Moderate
67A:							
Harpster	---	---	0	---	High	High	Low
69A:							
Milford	---	---	0	---	High	High	Low
91A:							
Swygert	Dense material	35-55	0	---	Moderate	High	Moderate
91B2:							
Swygert	Dense material	35-55	0	---	Moderate	High	Moderate
102A:							
La Hogue	---	---	0	---	Moderate	High	Moderate
125A:							
Selma	---	---	0	---	High	High	Low
134A:							
Camden	---	---	0	---	High	Moderate	Moderate
146A:							
Elliott	Dense material	20-45	0	---	Moderate	High	Moderate
146B2:							
Elliott	Dense material	20-45	0	---	Moderate	High	Moderate
147A:							
Clarence	Dense material	25-40	0	---	Moderate	High	Moderate
147B2:							
Clarence	Dense material	25-40	0	---	Moderate	High	Moderate
148B:							
Proctor	---	---	0	---	High	Moderate	Moderate
148B2:							
Proctor	---	---	0	---	High	Moderate	Moderate
149A:							
Brenton	---	---	0	---	High	High	Moderate
150B:							
Onarga	---	---	0	---	Moderate	Low	High
151A:							
Ridgeville	---	---	0	---	Moderate	Moderate	Moderate

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Initial	Total		Uncoated steel	Concrete
		In	In	In			
152A:							
Drummer	---	---	0	---	High	High	Moderate
153A:							
Pella	---	---	0	---	High	High	Low
189A:							
Martinton	---	---	0	---	Moderate	High	Moderate
192A:							
Del Rey	---	---	0	---	High	High	High
221C2:							
Parr	---	---	0	---	Moderate	High	Moderate
221C3:							
Parr	---	---	0	---	Moderate	High	Moderate
223B2:							
Varna	Dense material	24-60	0	---	Moderate	High	Moderate
223C2:							
Varna	Dense material	24-60	0	---	Moderate	High	Moderate
230A:							
Rowe	---	---	0	---	High	High	Moderate
232A:							
Ashkum	---	---	0	---	High	High	Moderate
235A:							
Bryce	---	---	0	---	High	High	Moderate
238A:							
Rantoul	---	---	0	---	High	High	Low
241C3:							
Chatsworth	Dense material	10-24	0	---	Moderate	High	Low
241D3:							
Chatsworth	Dense material	10-24	0	---	Moderate	High	Low
294B:							
Symerton	---	---	0	---	Moderate	High	Moderate
295A:							
Mokena	Dense material	33-60	0	---	Moderate	High	Low
330A:							
Peotone	---	---	0	---	High	High	Moderate
375A:							
Rutland	Dense material	40-60	0	---	Moderate	High	Moderate
375B:							
Rutland	Dense material	40-60	0	---	Moderate	High	Moderate
481A:							
Raub	---	---	0	---	High	High	Moderate
530B:							
Ozaukee	Dense material	20-45	0	---	Moderate	High	Low

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Initial	Total		Uncoated steel	Concrete
		In	In	In			
530D2:							
Ozaukee	Dense material	20-45	0	---	Moderate	High	Low
530E2:							
Ozaukee	Dense material	20-45	0	---	Moderate	High	Low
541B2:							
Graymont	---	---	0	---	High	High	Moderate
570C2:							
Martinsville	---	---	0	---	Moderate	Moderate	Moderate
614A:							
Chenoa	---	---	0	---	Moderate	High	Moderate
687B:							
Penfield	---	---	0	---	Moderate	Moderate	Moderate
802B:							
Orthents, loamy	---	---	0	---	Moderate	Moderate	Moderate
805B:							
Orthents, clayey	---	---	0	---	Moderate	High	Moderate
865.							
Pits, gravel							
1103A:							
Houghton	---	---	6-18	55-60	High	High	High
3107A:							
Sawmill	---	---	0	---	High	High	Low
3405A:							
Zook	---	---	0	---	High	High	Moderate

NRCS SOILS 37A
3/95

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

DESCRIPTION SYMBOL

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation, (national forest or park, state forest or park)
- Land grant
- Limit of soil survey (label) and/or denied access areas
- Field sheet matchline & neatline
- Previously published survey
- OTHER BOUNDARY (label)
- Airport, airfield (Davis airstrip)
- Cemetery (St Johns Cemetery)
- City / county Park (Central Park)
- STATE COORDINATE TICK
- LAND DIVISION CORNERS (section and land grants)
- GEOGRAPHIC COORDINATE TICK

TRANSPORTATION

- Divided roads
- Other roads
- # Trails

ROAD EMBLEMS & DESIGNATIONS

- Interstate (79, 79 345)
- Federal (410, 410 224)
- State (92, 92 347)
- County, farm, or ranch (376)
- RAILROAD
- POWER TRANSMISSION LINE (normally not shown)
- PIPELINE (normally not shown)
- FENCE (normally not shown)
- LEVEES
- Without road
- With road
- With railroad
- Single side slope (showing actual feature location)

DAMS

- Medium or small (W)

LANDFORM FEATURES

- Prominent Hill or Peak
- Soil Sample Site (S)

* Cultural features for use in Illinois

DESCRIPTION SYMBOL

CULTURAL FEATURES (cont.)

MISCELLANEOUS CULTURAL FEATURES

- Farmland, house (omit in urban areas)
- Church
- School
- Other Religion (label) (Mt Carmel)
- Located object (label) (Ranger Station)
- Tank (label) (Petroleum)
- Lookout Tower
- Oil and / or Natural Gas Wells
- Windmill
- Lighthouse

HYDROGRAPHIC FEATURES

STREAMS

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end

DRAINAGE AND IRRIGATION

- Double line canal (label) (CANAL)
- Perennial drainage and/or irrigation ditch
- Intermittent drainage and/or irrigation ditch

SMALL LAKES, PONDS, AND RESERVOIRS

- Perennial water
- Miscellaneous water
- Flood pool line (FLOOD POOL LINE)

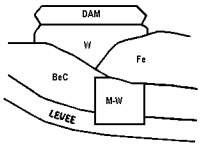
MISCELLANEOUS WATER FEATURES

- Spring
- Well, artesian
- Well, irrigation

DESCRIPTION SYMBOL

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS



LANDFORM FEATURES

- ESCARPMENTS
  - Bedrock
  - Other than bedrock
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION, closed
- SINKHOLE

EXCAVATIONS

- PITS
  - Borrow pit
  - Gravel pit
  - Mine or quarry
- LANDFILL

MISCELLANEOUS SURFACE FEATURES

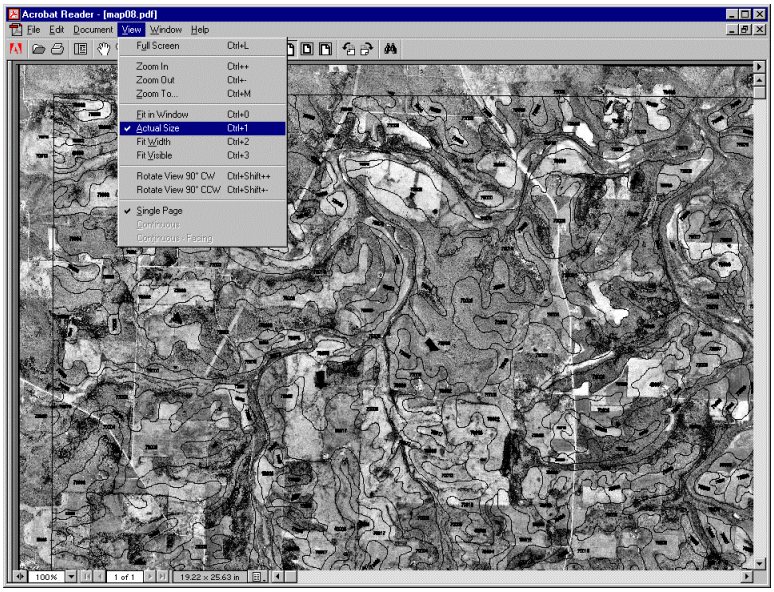
- Blowout
- Clay spot
- Gravelly spot
- Lava flow
- Marsh or swamp
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip
- Sodic spot
- Spoil area
- Stony spot
- Very stony spot
- Wet spot

RECOMMENDED AD HOC SOIL SYMBOLS

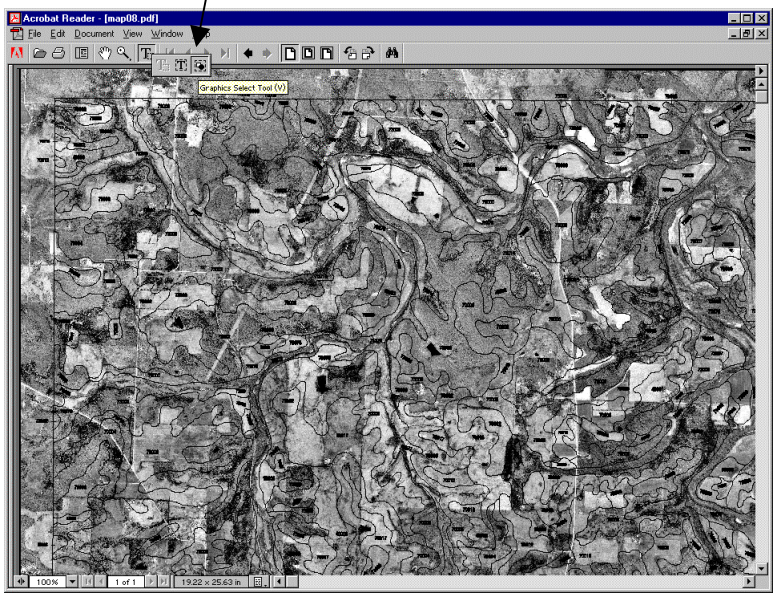
	SYMBOL_ID		SYMBOL_ID	
	1		23	
	2		24	
	3		25	
	4	Gray spot	26 GSP	
	5		27	
	6		28	
	7	Calcareous spot	29 CSP	
	8	Muck spot	30 MUC	
	9		31	
	10		32	
	11		33	
Dumps	12 DMP		34	
	13	Mine subsided Area	35 MSA	
	14		36	
Oil brine spot	15 OBS		37	
	16		38	
	17		39	
	18	Glacial Till spot	40 GLA	
	19		41	
Disturbed soil spot	20 DSS		42	
	21		43	
	22		44	

Printing Soil Survey Maps

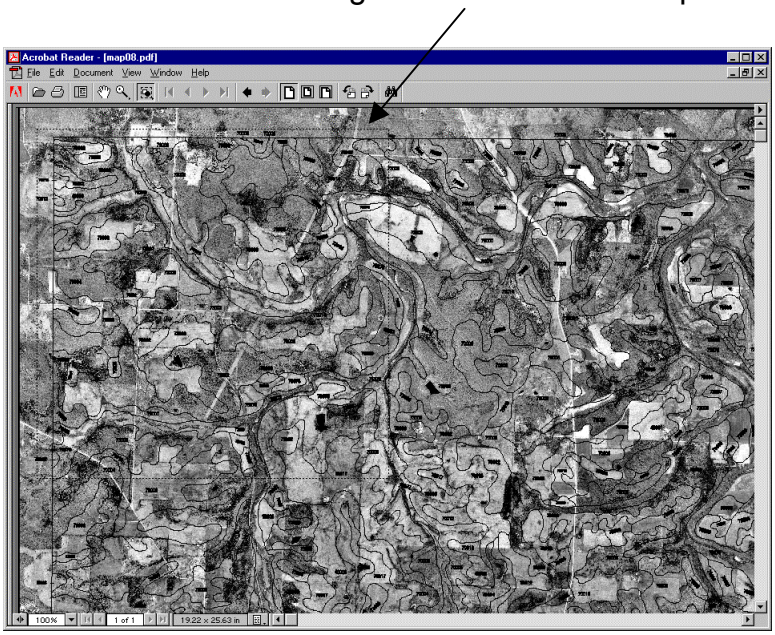
The soil survey maps were made at a scale of 1:12000 and were designed to be used at that scale. To print the maps at 1:12000 scale, set the view to Actual Size from the View pull down menu.



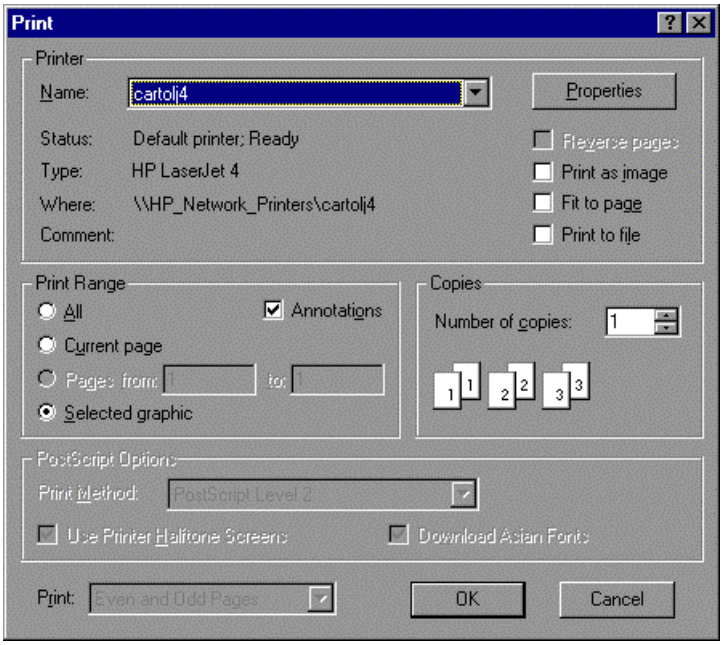
Using the pan tool, go to the area you would like to print. Select the Graphic Selection Tool by holding down the Text Selection Tool button and clicking on the Graphic Selection Tool button.



Then using the Graphic Selection Tool drag a box around the area you would like to print. Note dashed lines forming a box around area to print.



Select File Print. The Print Range will be set to Selected graphic. Click OK and the map will be sent to the printer.



Descriptions of Special Features

Name	Description	Label
Blowout	A small saucer-, cup-, or trough-shaped hollow or depression formed by wind erosion on a preexisting sand deposit. Typically 0.2 acre to 2.0 acres.	BLO
Borrow pit	An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically 0.2 acre to 2.0 acres.	BPI
Calcareous spot	An area in which the soil contains carbonates in the surface layer. The surface layer of the named soils in the surrounding map unit is noncalcareous. Typically 0.5 acre to 2.0 acres.	CSP
Clay spot	A spot where the surface layer is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser. Typically 0.2 acre to 2.0 acres.	CLA
Depression, closed	A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage. Typically 0.2 acre to 2.0 acres.	DEP
Disturbed soil spot	An area in which the soil has been removed and materials redeposited as a result of human activity. Typically 0.25 acre to 2.0 acres.	DSS
Dumps	Areas of nonsoil material that support little or no vegetation. Typically 0.5 acre to 2.0 acres.	DMP
Escarpment, bedrock	A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.	ESB
Escarpment, nonbedrock	A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.	ESO
Glacial till spot	An exposure of glacial till at the surface of the earth. Typically 0.25 acre to 2.0 acres.	GLA
Gravel pit	An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically 0.2 acre to 2.0 acres.	GPI
Gravelly spot	A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments. Typically 0.2 acre to 2.0 acres.	GRA

Name	Description	Label
Gray spot	A spot in which the surface layer is gray in areas where the subsurface layer of the named soils in the surrounding map unit are darker. Typically 0.25 acre to 2.0 acres.	GSP
Gully	A small channel with steep sides cut by running water through which water ordinarily runs only after a rain or after melting of snow or ice. It generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage.	GUL
Iron bog	An accumulation of iron in the form of nodules, concretions, or soft masses on the surface or near the surface of soils. Typically 0.2 acre to 2.0 acres.	BFE
Landfill	An area of accumulated waste products of human habitation, either above or below natural ground level. Typically 0.2 acre to 2.0 acres.	LDF
Levee	An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.	LVS
Marsh or swamp	A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Typically 0.2 acre to 2.0 acres.	MAR
Mine or quarry	An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines. Typically 0.2 acre to 2.0 acres.	MPI
Mine subsided area	An area that is lower than the soils in the surrounding map unit because of subsurface coal mining. Typically 0.25 acre to 3.0 acres.	MSA
Miscellaneous water	A small, constructed body of water that is used for industrial, sanitary, or mining applications and that contains water most of the year. Typically 0.2 acre to 2.0 acres.	MIS
Muck spot	An area that occurs within an area of poorly drained or very poorly drained soil and that has a histic epipedon or an organic surface layer. The symbol is used only in map units consisting of mineral soil. Typically 0.2 acre to 2.0 acres.	MUC
Oil brine spot	An area of soil that has been severely damaged by the accumulation of oil brine, with or without liquid oily wastes. The area is typically barren but may have a vegetative cover of salt-tolerant plants. Typically 0.2 acre to 2.0 acres.	OBS
Perennial water	A small, natural or constructed lake, pond, or pit that contains water most of the year. Typically 0.2 acre to 2.0 acres.	WAT

Name	Description	Label
Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit. Typically 0.2 acre to 2.0 acres.	ROC
Saline spot	An area where the surface layer has an electrical conductivity of 8 mmhos/cm-l more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm-l or less. Typically 0.2 acre to 2.0 acres.	SAL
Sandy spot	A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer. Typically 0.2 acre to 2.0 acres.	SAN
Severely eroded spot	An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name. Typically 0.2 acre to 2.0 acres.	ERO
Short steep slope	A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.	SLP
Sinkhole	A closed depression formed either by solution of the surficial rock or by collapse of underlying caves. Typically 0.2 acre to 2.0 acres.	SNK
Slide or slip	A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces. Typically 0.2 acre to 2.0 acres.	SLI
Sodic spot	An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less. Typically 0.2 acre to 2.0 acres.	SOD
Spoil area	A pile of earthy materials, either smoothed or uneven, resulting from human activity. Typically 0.2 acre to 2.0 acres.	SPO
Stony spot	A spot where 0.01 to 0.1 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones. Typically 0.2 acre to 2.0 acres.	STN
Unclassified water	A small, natural or manmade lake, pond, or pit that contains water, of an unspecified nature, most of the year. Typically 0.2 acre to 2.0 acres.	UWT

Name	Description	Label
Very stony spot	A spot where 0.1 to 3.0 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surface cover of the surrounding soil is less than 0.01 percent stones. Typically 0.2 acre to 2.0 acres.	STV
Wet depression	A shallow, concave area within an area of poorly drained or very poorly drained soils in which water is ponded for intermittent periods. The concave area is saturated for appreciably longer periods of time than the surrounding soil. Typically 0.2 acre to 2.0 acres.	WDP
Wet spot	A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit. Typically 0.2 acres to 2.0 acres.	WET